AUTHOR INDEX

Abbott, O. J., 329
Abel, C., 1503
Abeliovitz, A., 270
Adelberg, E. A., 566
Adler, H. E., 1245
Adler, H. I., 720, 1240
Akiyama, T., 975
Albrecht, A. M., 792
Aldrich, K. M., 600
Alexander, M., 1309
Allen, S. H. G., 171
Anacker, R. L., 39
Anderson, K. E., 408
Aron, H., 1123
Aron, S. A., 933
Ayres, J. C., 16
Azuma, Y., 1254

Bacila, M., 614
Bailey, G. F., 952
Baillie, A., 1221
Bakerspigel, A., 228
Baldwin, J. N., 593
Ball, M. M., 967
Bandur, B. M., 1471
Banerjee, A. B., 1397, 1402
Banville, R. R., 1192
Bare, L. N., 329
Barker, H. A., 504
Barnes, E. M., 737
Baron, L. S., 54, 209, 598
Beers, R. J., 1087
Bell, J. F., 676
Ben-Efraim, S., 236
Ben-Ishai, R., 1436
Benjaminson, M. A., 234
Benziman, M., 270
Bernheimer, A. W., 1100
Betz, J. V., 408
Bibb, W. R., 815
Bichowsky-Slomnicki, L., 236
Biegeleisen, J. Z., Jr., 1257
Birdsell, D. C., 962
Bishop, F. S., 574
Black, J. P., 1171
Bladen, H. A., 1180
Blumenthal, H. J., 377, 387
Bobbi, C., 743
Bojanowski, R., 75
Borchardt, K. A., 311
Borman, E. K., 1377
Bornside, G. H., 1443
Bose, S. K., 1397, 1402
Botan, E. A., 473
Bradley, S. G., 1056, 1157
Brandt, B., 120
Braun, W., 972, 1067, 1245
Braymen, D. T., 971
Brede, H. D., 479
Brennan, T. A., 473
Breslau, A. M., 468
Brinkley, F. B., 623
Brown, J. P., 1531
Buker, E. O., 676
Burrell, R. G., 900

Cabrera Juárez, E., 771
Cahoon, M., 1423
Camien, M. N., 1528
Campbell, A., 478
Campbell, J. J. R., 779
Campbell, L. L., 828, 1073
Cantrell, H. F., 1532
Casida, L. E., Jr., 150
Castleberry, M. W., 81, 1216
Chakravorty, M., 1246
Chambers, C. W., 910
Chan, E. C. S., 641
Chan, K., 1406
Charles, A. B., 737
Chase, L. R., 761
Cirillo, V. P., 232
Citarella, R. V., 209
Cleverdon, R. C., 652
Cobet, A. B., 710
Cohen, B., 1242
Colwell, R. R., 1412
Consigli, R. A., 1027, 1034
Converse, J. L., 81, 1216
Cooper, L. Z., 127, 136, 145
Corwin, L. M., 832
Cosenza, B. J., 652
Costilow, R. N., 114, 303
Cowan, C. I., 779
Cramblett, H. C., 1171
Crandell, R. A., 744
Cross, D. F., 761

Darlington, R. W., 939
Date, R. A., 547
Davis, E. V., 237
De Guzman, B. C., 234
De Hertogh, A. A., 746
Deibel, R. H., 988, 1406
Delwiche, E. A., 1527
De Sa, J. D. H., 86
Dienes, L., 1471
Doggett, R. G., 427

Doi, R. H., 323
Dondero, N. C., 286
Doneson, I. N., 61
Donnellan, J. E., Jr., 332
Drake, C. H., 962
Drucker, H., 241
Dunn, M. S., 1528
Dworkin, M., 316

Eberhart, B., 761
Edwards, E. A., 1254
Egeberg, M. C., 500
Egeberg, R. O., 500
Eisenstadt, J. M., 1355
Elconin, A. F., 500
Eldering, G., 543
Elliott, L. H., 238
Ellis, M. E., 8
Emmanouilidou-Arseni, A., 1253
Ensign, J. C., 924
Ephrussi-Taylor, H., 1211
Evans, H. J., 746
Ezekiel, D. H., 755

Falkow, S., 54, 209
Farrar, W. E., Jr., 832
Feary, T. W., 196
Field, A. K., 1238
Finkelstein, R. A., 1249
Finnerty, W. R., 1261
Firshein, W., 972, 1245
Fisher, E., Jr., 196
Fisher, T. N., 196
Fitz-James, P. C., 667, 1044, 1202, 1477, 1483
Flanagan, J. F., 977
Fletcher, R. D., 352
Foltz, V. D., 188
Fong, J., 1238
Forrest, W. W., 256
Fowler, A. V., 1528
Frampton, E. W., 1369
Freed, B. A., 1211
Freeman, B. A., 438, 1492
Freeman, B. O., 967
Fuentes-Marins, R., 744
Fukushi, K., 391
Fulton, M., 527
Furcolow, M. L., 1364

Gafford, L. G., 939
Garner, H. R., 230
Gaudy, E., 75
Genghof, D. S., 852
Gerhardt, P., 945
Gibbons, R. J., 1512
Ginoza, H. S., 1339
Ginsberg, H. S., 977, 1027, 1034
Ginzburg, Y., 1452
Glenn, A., 227
Goddard, J. L., 844
Goldberg, H. S., 737
Goldfine, H., 8
Goldin, M., 227
Goldman, M., 377, 387
Gordon, F. B., 1251
Gottlieb, S. F., 838
Graham, B., 543
Greenberg, J., 536, 1094
Gregory, K. F., 1281, 1287
Griffin, T. B., 1227
Grogan, J. B., 973
Groman, N. B., 446
Guirard, B. M., 370
Gunner, H. B., 1309
Gwinn, D. D., 519

Hakada, H. I., 1123
Hall, W. H., 1056
Halvorson, H. O., 68
Hampp, E. G., 1180
Hancock, R., 1044
Hanks, J. H., 1317
Hardigree, A. A., 720, 1240
Hardy, P. H., Jr., 1521
Harmon, S. A., 593
Harrison, G. M., 427
Hasenclever, H. F., 1
Hash, J. H., 432
Haskins, W. T., 391
Heady, R. E., 1406
Hedrick, L. R., 220, 1462
Hellman, A., 744
Henneman, D. H., 1266, 1274
Hentges, D. J., 527
Heym, G. A., 461
Hines, W. D., 438, 1492
Hirota, Y., 341, 554
Hogg, L., 1011, 1079, 1118, 1137
Homma, J. Y., 630
Hooser, L. E., 237
Hovnanian, H. P., 473
Howard, D. H., 33
Huang, J. C. C., 1281, 1287
Hulcher, F. H., 39
Hummeler, K., 1105
Hungate, R. E., 1304
Hutchison, D. J., 786, 792
Huxsoll, D. L., 238
Hyatt, M. T., 876
Hyde, J., 939

Iandolo, J. J., 235
Igarashi, R. T., 323
Imai, N., 401
Ingraham, J. L., 356
Inoue, Y. K., 1239

Ishibashi, M., 554
Iverson, W. P., 478

Jacobs, J. M., 1406
Jacobs, N. J., 1406
James, A. W., 150
Janicki, B. W., 933
Jayne, A., 454
Jellison, W. L., 676
Johnson, A. G., 809
Johnson, A. H., 786
Johnson, E. J., 684, 973
Johnson, E. M., 54
Johnson, H. W., 547
Johnson, R. C., 422
Jones, G. E., 483
Judge, J. A., 945
Juni, E., 461

Kabler, P. W., 910
Kallio, R. E., 968, 1261
Kalter, S. S., 744
Kanazir, D., 743
Karakawa, W. W., 1377
Kaufman, L., 120
Kellermeyer, R. W., 171
Kelner, A., 1295
Kelton, W. H., 588
Kemp, S., 1011, 1079
Kerr, K. M., 478
Khairat, O., 963
Khoobyarian, N., 24
Kibrick, S., 1060
Kinsel, N. A., 1243
Kirsch, E. J., 247
Kitahara, K., 1429
Kitsuji, N., 802
Klein, H. P., 1355
Knaysi, G., 619, 1129
Kocholaty, W., 1140
Kolstad, R. A., 1157
Korshalla, J. D., 247
Koumentakou, I., 1253
Krieg, N. R., 1526
Krishnapillai, V., 598
Kronish, D. P., 581
Kubota, M. Y., 468
Kusaka, T., 1383
Kushner, D. J., 1147
Kwapinski, J. B., 1234

Lackman, D. B., 676
Lahav, M., 1436
Lamanna, C., 965
Landy, M., 391
Lanphier, E. H., 838
Larsh, H. W., 1364
Lau, H. S., 337
Layne, J. S., 684
Leach, F. R., 1529
Lee, Y. C., 1521
Leifson, E., 652
Levine, L., 1321
Levinson, H. S., 332, 876
Levy, S. B., 1330
Lewis, M. J., 1389
Lim, P. G., 1051
Ling, C.-M., 1462
Lones, G. W., 1114
Lord, T. H., 188
Love, S. H., 39
Ludwig, E. H., 964
Lumi, R., 743

McConnell, S. J., 238
McCormick, N. G., 68
McFarland, C. R., 1377
McLean, R. A., 1258
MacLeod, P., 1531
MacLeod, R. A., 510
McWhorter, A. C., 967, 1248
Madoff, M. A., 127, 136, 145
Madoff, S., 1471
Maeda, K., 975
Mahler, I., 1423
Mallette, M. F., 779, 965
Mandel, M., 1412
Manion, R. E., 1056
Marcus, S., 1019
Margherita, S. S., 1304
Markovetz, A. J., 968
Markowitz, H., 232
Marmur, J., 1423
Marr, A. G., 356
Martin, W. J., 1019
Mascoli, C. C., 478
Matches, J. R., 16
Mateles, R. I., 1051
Matula, T. I., 510
Maurizi, J., 838
Mayeux, P. A., 746
Means, U. M., 547
Megraw, R. E., 1087
Mendelson, J. A., 623
Merkel, J. R., 1227
Merritt, C. B., 1443
Michael, J. G., 1067
Mickelson, M. N., 1251
Middleton, G. K., Jr., 1171
Miller, P. A., 432
Milner, K. C., 391
Mitchell, P. D., 900
Mizushima, S., 1429
Moffet, H. L., 1171
Mohan, R. R., 581
Monley, A., 1177

Moore, M. L., 237
Moran, A. B., 1248
Morris, G. K., 263
Mukherjee, B. B., 1227
Murchelano, R., 652
Murphey, W. H., 1198

Nags, E. H., 332
Nahmias, A. J., 1060
Nakada, H. I., 1123
Neikirk, R. L., 1526
Nell, E. E., 1521
Nellis, L. F., 230
Nero, L. C., 220
Nester, E. W., 867
Newcomb, H. R., 701
Niederpruem, D. J., 316
Nishimura, Y., 341
Norris, J. R., 1221
Nowotny, A., 809
Noyes, H. E., 623

Okada, M., 727
O'Kane, D. J., 97
Okrend, H., 286
Olson, B. H., 543
Olson, N. O., 478
Oree, L. V., 743
Ordal, Z. J., 235
Orskov, F., 341
Orskov, I., 341
Oster, M. O., 104
Owen, C. R., 676

Padgett, B. L., 363, 454
Painter, R. B., 1339
Pakes, S. P., 81
Panos, C., 1242
Parks, L. W., 920
Peacock, C., 1114
Pearson, G. R., 438, 1492
Pepper, R. E., 303
Percell, P. B., 952
Phaff, H. J., 1389
Pierce, W. A., Jr., 311
Pigg, C. J., 920
Piraino, F., 1503
Pittard, J., 1256
Plastridge, W. N., 352
Pootjes, C., 1259
Postgate, J. R., 1073
Powell, C. J., Jr., 1249
Prescott, J. M., 1227
Pritchard, W. L., 623

Ramakrishnan, T., 566
Randall, C. C., 939
Ratledge, C., 823
Ravin, A. W., 86
Raycroft, R. E., 799
Reich, C. V., 1317
Ribi, E., 391
Ritter, R., 1364
Rodriguez, A. R., 744
Rogers, P., 422
Rogosa, M., 162, 574
Rolinson, G. N., 887
Romano, A. H., 156
Rose, M. J., Jr., 933
Rose, N. R., 838
Rosenblum, E. D., 1198
Rosenkranz, H. S., 606
Rowley, D. B., 701
Russell, K. E., 237

Sacks, L. E., 952
St. Geme, J. W., Jr., 969
Sakaguchi, G., 401
Sakaguchi, S., 401
Sato, R., 1383
Saunders, G. F., 1073
Schmidt, P. J., 1003
Schwartz, B. S., 581
Schwartz, L. L., 1100
Sellers, W., 46
Shafia, F., 999
Shankel, D. M., 61
Shifrine, M., 1245
Shoji, K., 1383
Shulenberger, H., 1171
Siem, R. A., 237
Silver, W. S., 416
Simon, E. H., 481
Sinclair, N. A., 562
Slade, H. D., 1251
Slotnick, I. J., 961
Small, T., 972
Smith, C. D., 1364
Smith, D. C., 188
Smull, C. E., 964
Snell, E. E., 370
Snyder, E. M., 81
Sokatch, J. R., 844
Sonneborn, D. R., 1321
Sorsoli, W. A., 920
Soto, P. J., Jr., 1216
Southall, P. F., 961
Speck, M. L., 49
Spertzel, R. O., 238
Squires, C. L., 356
Starr, M. P., 293
Stephens, W. L., 293
Stevens, J. G., 446
Stjernholm, R. L., 171
Stokes, J. L., 562
Storz, H., 1304

Straughn, W. R., 815
Sud, I. J., 696
Sugino, Y., 554
Summers, D. F., 1
Sussman, M., 1321
Sutherland, R., 887
Suzuki, N., 630
Sword, C. P., 690
Sylvester, C. J., 114

Tabak, H. H., 910
Takacs, F. P., 510
Takahashi, I., 1499
Tanabe, O., 226
Tankersley, R. W., Jr., 609
Tarver, M. G., 220
Taylor, J. J., 748
Taylor, N. W., 863
Thomas, R. S., 952
Thompson, T. L., 999
Thorne, C. B., 519
Tonomura, K., 226
Toohey, J. I., 504
Tove, S. B., 49
Traganza, E. D., 1227
Tumilowicz, J. J., 1105
Turner, W., 1251
Tyler, M. E., 696

Umbreit, W. W., 1243, 1266, 1274
Ushiba, D., 975

Valentine, R. C., 75, 241
Van Damme, O., 852
Vela, G. R., 476

Wachsman, J. T., 1011, 1079, 1118, 1137
Walker, D. J., 256
Walker, D. L., 363, 454
Walker, H. W., 16
Wallis, E. S., 427
Watanabe, T., 727
Watson, D. W., 1452, 1457
Wegener, W. S., 156
Weil, A. C., 1443
Weil, A. J., 234
Weinman, D. E., 263
Weinstein, L., 127, 136, 145
Welker, N. E., 828
Werly, E. F., 1177
Wick, W. E., 1162
Widra, A., 1532
Wilkins, P. O., 232
Williams, W. L., 263
Williamson, W. T., 49
Willoughby, D. S., 1452, 1457
Wilson, D. D., 1529
Wilson, J. B., 237
Winder, F. G., 823
Winter, B. A., 1529
Wiseman, R. F., 329, 337
Wishnick, M., 432
Witter, L. D., 1254
Wohlhieter, J. A., 209
Wolfe, R. S., 75, 241, 924, 993
Wolin, E. A., 993
Wolin, M. J., 993
Wood, H. G., 171
Wood, N. P., 97, 104
Wood, W. B., 751
Woodside, E. E., 1140
Woody-Karrer, P., 536
Wright, M. J., 454
Wyss, O., 476

Yager, R. H., 238
Yamada, M.-A., 1239
Yonenaka, H. H., 1123
Youmans, A. S., 278, 1346
Youmans, G. P., 278, 1346
Yousten, A. A., 1527

Zamir, A., 1436
Zampieri, A., 1094
Zancan, G. T., 614
Zierdt, C. H., 1003
Zimmerman, L. N., 799
Zinneman, H. H., 1056
ZoBell, C. E., 710

SUBJECT INDEX

Acanthamoeba castellani, growth with *Torulopsis famata*, 220
Acetobacter xylinum, metabolism of dicarboxylic acids in, 270
Acids, *see* Amino, Deoxyribonucleic, Dicarboxylic, Fumaric, Glycolic, Hyaluronic, Lactic, Lipoic, Nucleic, Propionic, Ribonucleic
Acridine dyes, induction of tyrosinase deficiency by, 1287
Actinomycetales, cytoplasmic antigen relationships in, 1234
Adansonian analysis of gram-negative bacteria, 1412
Adenine, repression of formyltetrahydrofolate synthetase by, 792
Adenovirus, interference with vaccinia virus, 24
Adenovirus, type 5, infection of HeLa cells, 1027, 1034
Adenovirus, type 5, multiplication of, 977
Aeromonas proteolytica sp. n., activity of, 1227
Agrobacterium, synthesis of lecithin, 8
Airborne *Cryptococcus neoformans*, infection of mice with, 1364
L-Alanine dehydrogenase from *Bacillus cereus*, 68
Alkanes and alkenes, assimilation by yeasts, 968
Allantoin degradation by *Streptococcus allantoicus*, 75
Allantoin fermentation by *Streptococcus allantoicus*, 241
Alpha-hemolysis, staphylococcal, kinetics of, 127, 136, 145
Amino acid requirements of herpes simplex virus, 609
Amino acids, incorporation into pneumococcal deoxyribonucleic acid, 1211
Amino acids, shock excretion by yeasts, 1389
α-Amylase, in *Aspergillus oryzae*, 226
α-Amylase, synthesis by *Bacillus stearothermophilus*, 828
α-Amylase, synthesis in *Pseudomonas saccharophila*, 1355
Anaerobic jars, modernization of, 963
Antibiotic control of tissue reactions in dogs vaccinated with *Coccidioides immitis*, 1216
Antibiotic stability, influence on in vitro testing, 1162
Antibiotics, effect on uric acid-fed chicks, 329
Antifungal peptide, biosynthesis of, 1397, 1402
Antigen changes during *Bacillus cereus* spore formation, 1221
Antigens, nodule, in classification of *Rhizobium japonicum*, 547
Antigens, O, structure and function of, 809
Antigens of poliovirus, separation by chromatography, 1105
Antistreptolysin O determinations, protocol for, 1254
Arginine, as energy source for *Streptococcus faecalis*, 988
Arginine control of uracil synthesis, 1436
Aromatic compounds, metabolism in phenol-adapted bacteria, 910
Arthrobacter crystallopoietes, morphogenesis in, 924
Arthrobacter globiformis, morphological abberrations of, 641
Arthrobacter terregens, use for bioassay of mycobactin, 1317
Ascites fluid, mouse, inhibition of yeast growth, 1
Asparate, effect on *Pseudomonas saccharophila*, 1355
Aspartate transcarbamylase activity in adenovirus-infected HeLa cells, 1027, 1034
Aspergillus oryzae, α-amylase in, 226
Assay, for bacteriophage T_3, 1177
8-Azaguanine, effect on ribonucleic acid distribution, 755
Azotobacter, cyst formation in, 684
Azotobacter encystment, stain for, 476

Bacilli, gram-negative nonfermenting, differentiation of, 46
Bacillus anthracis, isolation from soil stored 60 years, 237
Bacillus cereus, L-alanine dehydrogenase from, 68
Bacillus cereus, antigen changes during spore formation, 1221
Bacillus cereus, cell-wall degradation, 581
Bacillus cereus, effect of temperature on germination of, 619
Bacillus cereus, glucose catabolism in, 377
Bacillus cereus, glyoxylate metabolism in, 1087
Bacillus cereus, respiratory pathways, 387
Bacillus cereus, spheroplast formation, 581
Bacillus cereus spores, germination of, 1129
Bacillus lentimorbus, glucose catabolism by, 303
Bacillus lentimorbus, nutritional requirements, 114
Bacillus licheniformis, transformation of, 519
Bacillus megaterium, action of penicillin, bacitracin, and vancomycin on, 1044,
Bacillus megaterium, doubly auxotrophic mutants of, 1118
Bacillus megaterium, effect of 5-fluorouracil on, 1011
Bacillus megaterium, electron microscopy of, 1202
Bacillus megaterium, fate of mesosomes during protoplasting, 1483
Bacillus megaterium, porosity of cell walls of, 945
Bacillus megaterium, ribonucleic acid accumulation in, 755
Bacillus megaterium, sporulation in, 667

Bacillus megaterium, thymineless death in, 1079, 1118
Bacillus megaterium mutants, isolation with 5-fluorouracil, 1137
Bacillus megaterium spores, effect of sporulation medium on, 876
Bacillus polymyxa, phospholipids in, 16
Bacillus popilliae, glucose catabolism by, 303
Bacillus popilliae, nutritional requirements, 114
Bacillus stearothermophilus, α-amylase synthesis by, 828
Bacillus stearothermophilus, isolation of bacteriophage $\phi\mu$-4 from, 999
Bacillus subtilis, deoxyribonucleic acid transfer in, 1423
Bacillus subtilis, genetic transformability of, 1295
Bacillus subtilis, penicillin resistance of competent cells, 867
Bacillus subtilis, radioresistance in sporulating cultures, 701
Bacillus subtilis, serum inhibition of respiration and growth, 1443
Bacillus subtilis, synthetic media for, 332
Bacillus subtilis spores, incorporation of bacteriophage genome by, 1499
Bacillus subtilis spores, ribonucleic acids of, 323
Bacitracin, action on *Bacillus megaterium*, 1044
Bacteriophage $\phi\mu$-4, characterization of, 999
Bacteriophage-controlled restriction, effect on genetic linkage, 1256
Bacteriophage, for *Hydrogenomonas facilis*, 1259
Bacteriophage, of *Streptomyces venezuelae*, 1157
Bacteriophage, *Pseudomonas aeruginosa*, 973
Bacteriophage, sex factor-specific, of *Escherichia coli*, 727
Bacteriophage genome, incorporation by *Bacillus subtilis* spores, 1499
Bacteriophage infections, effect of nonionic surfactants on, 933
Bacteriophage PBS2 transduction of *Bacillus subtilis*, 1423
Bacteriophage T_2, irradiated, isologous interference with, 1330
Bacteriophage T_3, assay by plaque count, 1477
Bacteriophages, from lysogenic *Pseudomonas aeruginosa*, 196
Bacteriophages active on *Clostridium sporogenes*, 408
Bacterium, halophilic, disintegration of, 1147
Bacteroides-like organism, 737
Benzethonium chloride, effect on pertussis vaccine, 543
Beta-hemolytic streptococci, grouping of, 227
Biotin deficiency, effect on *Arthrobacter globiformis* morphology, 641
Black light inactivation of transforming deoxyribonucleic acid, 771
Blastomyces dermatitidis, enhanced toxicity in, 748
Bordetella pertussis, stabilization with benzethonium chloride, 543
Borrelia vincentii, ultrastructure of, 1180
Botulinus toxin, type E, toxicity of, 401
Brewer's yeast, excretion of amino acids by, 1389
5-Bromodeoxyuridine, effect on *Escherichia coli* radioresistance, 743
Brucella spheroplasts, production of, 438
Brucella suis, spheroplasts, fine structure of, 1492
Butyrivibrio, strain variation, 1304

Candida albicans, cytology of, 228
Candida albicans, inhibition of growth, 1
Candidiasis in cortisone-treated mice, 1532
Capsular polysaccharide, biosynthesis of, 461
Capsule formation by resting cells, 461
Carbamyl oxamate, role in allantoin degradation, 75
Carbohydrate content of *Escherichia coli*, 1140
Carbohydrate-utilizing *Staphylococcus aureus*, medium for, 1198
Cellulase activity of *Neurospora crassa*, 761
Cellulose acetate membranes, in grouping of streptococci, 227
Cellvibrio gilvus mutant, pigment in, 39
Cell division of *Escherichia coli*, genetic control of, 720
Cell membrane, effect on rate of respiration, 1274
Cell membranes, effect of sodium and potassium on, 1266
Cell-wall autolysis in *Bacillus cereus*, 581
Cell-wall composition of marine bacteria, 696
Cell walls, porosity of, 945
Cesium chloride, in determination of deoxyribonucleic acid base composition, 1073
Chelating agents, effect on *Escherichia coli* growth, 483
Chicks, effect of dietary antibiotics on, 329
Chloramphenicol, effect on ribonucleic acid distribution, 755
Chondromyces, isolation and purification, 230
Chrysosporium, differentiation from *Histoplasma capsulatum*, 120
Citrulline, transport in *Streptococcus faecalis*, 815
Clark, William Mansfield, obituary, 751
Clostridial toxins, in wound exudates, 623
Clostridium, anaerobic psychrophilic strains of, 562
Clostridium botulinum type E, toxins of, 401
Clostridium butyricum, synthesis of *N*-methylethanolamine, 8
Clostridium sporogenes, bacteriophages active on, 408
Clostridium sporogenes, sulfonamide resistance of, 1526
Clostridium tetanomorphum, cobamide enzymes in, 504
Coagulase, antiphagocytic function of, 311

Cobalt, effect on propionate oxidation by *Rhizobium meliloti*, 746
Cobamide coenzymes, in *Clostridium tetanomorphum*, 504
Coccidioides immitis, cultivation of spherules, 468
Coccidioides immitis, ecology of, 500
Coccidioides immitis, mannitol metabolism by, 1114
Coccidioides immitis, use as viable vaccine, 81, 1216
Coccidioidomycosis, experimental, 81
Coenzyme production in *Clostridium tetanomorphum*, 504
Coliform bacteria, in uric acid-fed chicks, 329
Coliform bacteria, production of riboflavine, 337
Continuous culture of *Coccidioides immitis*, 468
Cortisone-treated mice, candidiasis in, 1532
Coxsackie A6 virus, behavior in murine cells, 969
Cryptococcus neoformans, infection of mice with, 1364
Cryptococcus neoformans, inhibition of growth, 1
Cyanocobalamine, *Sphaerotilus* requirement for, 286
Cyst formation in *Azotobacter*, 684
Cystic fibrosis patients, *Pseudomonas aeruginosa* from, 427
Cytochromes, in mycobacteria, 1383
Cytology of *Candida albicans*, 228
Cytopathology of infectious bovine rhinotracheitis virus, 446
Cytoplasm from Actinomycetales, antigenic relationships, 1234

Dehydrogenases, radiosensitivity during sporogenesis, 701
Deoxyribonucleic acid, black light inactivation of, 771
Deoxyribonucleic acid, incorporation of thymidine and nucleic acid, 1211
Deoxyribonucleic acid, of sulfate-reducing bacteria, 1073
Deoxyribonucleic acid base composition of gram-negative bacteria, 1412
Deoxyribonucleic acid synthesis in *Diplococcus pneumoniae*, 972
Deoxyribonucleic acid synthesis in pneumococci, inhibitors of, 1245
Deoxyribonucleic acid transfer in transduction of *Bacillus subtilis*, 1423
Deoxyribonucleic acid transformation of *Bacillus subtilis*, 867
Dicarboxylic acids, metabolism in *Acetobacter xylinum*, 270
Dictyostelium discoideum, aggregation in, 1321
Diffusion chamber, in study of typhoid immunity, 975
Diplococcus pneumoniae, deoxyribonucleic acid synthesis, 972
Dissociation in *Pseudomonas aeruginosa*, 1003
Drug-resistance factor R, effect on *Escherichia coli*, 341
Dye-iodine complex, state of association, 965

Eaton agent, agglutination of, 478
El Tor vibrios, isolation of, 1249
Electron microscopy of *Bacillus megaterium*, 1202
Electron microscopy of myxoma virus, 454
Electron transport system in *Myxococcus xanthus*, 316
Endogenous metabolism in *Streptococcus faecalis*, 256
Endophyte of *Myrica cerifera*, 416
Endospores, *Bacillus cereus*, germination of, 1129
Endotoxin, entobacteriaceal, pyrogenic and emetic properties of, 1019
Endotoxin, extraction from Enterobacteriaceae, 391
Endotoxin, inactivation by guinea-pig liver, 832
Endotoxoids, biological properties of, 809
Enterobacteriaceae, extraction of endotoxin from, 391
Enterobacteriaceal endotoxin, pyrogenic and emetic properties, 1019
Enterotoxin, staphylococcal, properties of, 1019
Enterotoxin B, bacterial resistance to, 971
Enteroviruses, precipitin tests for, 1171
Enzyme formation by *Streptococcus mitis*, 1512
Enzymes, in propionic acid fermentation, 171
Enzymes, radiosensitivity during sporogenesis, 701
Enzymes, *see also* α-Amylase, Dehydrogenase, β Glucosidase, β-Galactosidase, Isocitratase, Penicillinase, Transaminase
Ergothioneine, biosynthesis by mycobacteria, 852
Erythrocytes, rabbit, hemolysis of, 127, 136, 145
Escherichia coli, carbohydrate and lipid content, 1140
Escherichia coli, cell elongation in, 1240
Escherichia coli chromosome, thymineless mutation site on, 802
Escherichia coli, control of uracil synthesis in, 1436
Escherichia coli, cross-resistance relationships in, 1094
Escherichia coli, effect of 5-bromodeoxyuridine on radioresistance of, 743
Escherichia coli, effect of chelating agents on growth, 483
Escherichia coli, effect of R factor on F properties, 341
Escherichia coli, effect of sodium and potassium on membranes of, 1266
Escherichia coli, filament formation by, 710
Escherichia coli, formation of β-galactosidase, 356
Escherichia coli, gene controlling cell division in, 720

Escherichia coli, genetic crosses with *Salmonella typhosa*, 54
Escherichia coli, genetic recombination in, 1339
Escherichia coli, growth in iron-deficient medium, 823
Escherichia coli, growth in phosphate-deficient medium, 779
Escherichia coli, inhibition of respiration, 1274
Escherichia coli, interference of hydroxylamine with streptomycin lethality for, 606
Escherichia coli, mutation to streptomycin resistance, 61
Escherichia coli, prototrophic mutant of, 1051
Escherichia coli, reaction of human serum against, 1067
Escherichia coli, sex factor-specific bacteriophage of, 727
Escherichia coli, thymine and arginine genes in, 554
Escherichia coli, transfer of F-linked genes from, 209
Escherichia coli mutants, resistance to proflavine, 536
Escherichia coli mutants, valine-resistant, 566

F′ transport of thymine gene in *Escherichia coli*, 554
Ferric iron, reversal of serum inhibition of *Bacillus subtilis*, 1443
Ferrobacillus sulfooxidans, effect of electrolysis on, 1243
Filament formation by *Escherichia coli*, 710
Flagellar antigens of *Salmonella ribislaw*, 967
Flagellation of marine bacteria, 652
Fluorescein-labeled antibody, type 1, preparation of, 1377
Fluorescent-antibody studies of fungi, 120
5-Fluorouracil, as selective agent for leptospiral growth, 422
5-Fluorouracil, effect on *Bacillus megaterium*, 1011
5-Fluorouracil, for isolation of *Bacillus megaterium* mutants, 1137
Folic acid metabolism in *Streptococcus faecalis* mutants, 786
Formate-pyruvate exchange reaction, in *Streptococcus faecalis*, 97, 104
Formyltetrahydrofolate synthetase, repression by adenine, 792
Fowlpox virus, composition of, 939
Francisella novicida, comparison with *F. tularensis*, 676
Francisella tularensis, comparison with *F. novicida*, 676
Fructose-6-phosphate reductase from *Salmonella gallinarum*, 614
Fumaric acid-producing strain of *Rhizopus nigricans*, 156
Fungi, differentiation by fluorescent-antibody reagents, 120
Fusarium oxysporum, anaerobic growth of, 1309

β-Galactosidase, formation by *Escherichia coli*, 356
Gaseous environment, effect on vibrios, 352
Genetic crosses, *Escherichia coli* and *Salmonella typhosa*, 54
Genetic derepression of enzymes in *Escherichia coli*, 566
Genetic linkage, effect of phage-controlled restriction on, 1256
Genetic linkage of pneumococcus and streptococcus, 86
Genetic locus of *Escherichia coli* radiation sensitivity, 720
Genetic recombination, effect on *Salmonella typhimurium* virulence, 598
Genetic recombination in *Escherichia coli*, 1339
Genetic transfer from *Escherichia coli* to *Proteus*, 209
Georgia bulgaricus factor, in growth of lactic acid bacteria, 263
Germination in *Bacillus cereus*, effect of tempera ture on, 619
Glucosamine-6-phosphate, degradation by *Proteus vulgaris*, 1123
Glucose catabolism in *Bacillus cereus*, 377
Glucose catabolism in *Bacillus popilliae* and *B. lentimorbus*, 303
β-Glucosidase system of *Neurospora crassa*, 761
Glycolic acid in *Mycobacterium ranae*, 1528
Glycolytic enzymes in *Lactobacillus plantarum*, 1429
Glyoxylate fermentation by *Streptococcus allantoicus*, 241
Glyoxylate metabolism in *Bacillus cereus*, 1087
Gram-negative bacilli, nonfermenting, differentiation of, 46
Gram-negative bacteria, deoxyribonucleic acid base composition of, 1412
Gram-negative organisms, inhibition of respiration, 1274
Gram stain, chromatographic analysis, 965
Growth factor for lactic acid bacteria, 263

Haemophilus gallinarum, isolation of organism similar to, 1245
Haemophilus influenzae, transforming deoxyribonucleic acid from, 771
Halobacterium cutirubrum, disintegration of, 1147
Hansenula subpellicosa, proline oxidases in, 1462
Hansenula wingei, sexual agglutination of, 863
Heat resistance of spores, relation to lipids, 16
HeLa cells, type 5 adenovirus-infected, aspartate transcarbamylase activity in, 1027, 1034
Hemin, effect on growth of bacteria, 1406
Hemolysis, induced in *Staphylococcus* species, 188

Hemolytic activity of staphylococcal alpha-lysin, 127, 136, 145
Heparin, inhibitory effect on herpes simplex virus, 1060
Hercynine, biosynthesis by mycobacteria, 852
Herpes simplex virus, amino acid requirements, 609
Herpes simplex virus, effect of heparin on, 1060
Histidine decarboxylase production by *Lactobacillus*, 370
Histiocytes, mouse, *Histoplasma capsulatum* in, 33
Histone, use in increasing poliovirus infectivity 964
Histoplasma capsulatum, intracellular behavior, 33
Histoplasma capsulatum, mycelial form of, 120
Hyaluronic acid production by group A streptococci, 1452
Hydrogenomonas facilis, bacteriophage for, 1259
Hydrostatic pressure, effect on *Escherichia coli*, 710
Hydroxylamine, effect on streptomycin lethality, 606

Immunofluorescence, in diagnosis of listeriosis, 1257
Immunofluorescence, in typing of group A streptococci, 1377
Immunofluorescence microscopy, rapid, 473
Immunogenic substance from *Mycobacterium tuberculosis*, 278
In vitro testing, effect of antibiotic stability on, 1162
Indole-excreting mutant of *Escherichia coli*, 1051
Infectious bovine rhinotracheitis virus replication, 446
Influenza B virus, precipitin test for, 1171
Influenza virus, enzymatic variants of, 363
Inoculator, automatic, 962
Irradiated bacteria, synthesis of ribonucleic acid in, 1369
Irradiated bacteriophage T_2, interference capacity of, 1330
Iron-deficient medium, Escherichia coli growth in, 823
Isocitratase formation, in *Rhizopus nigricans*, 156
Isoleucine, biosynthesis in *Escherichia coli*, 566

Japanese encephalitis virus, assay of, 1239

2-Ketogluconate fermentation by *Streptococcus faecalis*, 844
Klebsiella, mixed culture with *Shigella*, 527

L forms of *Staphylococcus aureus*, growth of, 1192
L forms of *Streptococcus pyogenes*, growth of, 1242
L-type growth in *Neisseria gonorrhoeae*, 1471
Lactic acid bacterium, growth factor for, 263
D-Lactic acid in *Mycobacterium ranae*, 1528
Lactobacilli, in uric acid-fed chicks, 329
Lactobacillus, nutritional requirements, 370
Lactobacillus bulgaricus, growth factor for, 263
Lactobacillus plantarum, glycolytic enzymes in, 1429
Lactobacillus plantarum, metabolism of mannitol in, 1246
Lecithin, synthesis by bacteria, 8
Leptospirae, growth with 5-fluorouracil, 422
Lipid content of *Escherichia coli*, 1140
Lipids, bacterial, *N*-methyl groups in, 8
Lipoic acid, role in pyruvate transport, 1529
Listeriosis, diagnosis by immunofluorescence, 1257
Lysosomes, disruption by bacterial toxins, 1100
Lysozyme-sensitive staphylococci, 690

M antigen, type-specific, absence from streptococci, 1251
Malate oxidation in *Acetobacter xylinum*, 270
Mammalian cells, ribonucleic acid biosynthesis in, 977
Mannitol, metabolism by *Coccidioides immitis*, 1114
Mannitol, metabolism in *Lactobacillus plantarum* 1246
Mannitol 1-phosphate dehydrogenase, induction in *Lactobacillus plantarum*, 1246
Marine bacteria, cell-wall composition, 696
Marine bacteria, motile, 652
Marine bacteria, nutrition and metabolism, 510
Marine bacteria, osmotic fragility, 696
Marine bacterium, *Aeromonas proteolytica*, 1227
Marine pseudomonad, sodium and potassium ions in, 510
Medium, for differentiating gram-negative bacilli, 46
Medium, synthetic, for *Bacillus subtilis* spores, 332
Membrane transport studies, use of uranyl ion, 232
Mercaptan production, demonstration of, 478
Mesosomes of *Bacillus megaterium*, fate during protoplasting, 1483
Methane formation, inhibition in *Methanobacillus omelianskii*, 993
Methanobacillus omelianskii, viologen dye inhibition of, 993
Methicillin-induced lysozyme-sensitive staphylococci, 690
Methicillin-resistant staphylococci, 887
Methionine-activating enzyme, in *Saccharomyces cerevisiae*, 920
Methyl transfer system, biogenesis of mitomycins, 247
5-Methyl-tryptophan, effect on α-amylase synthesis, 828
Micrococcus cerificans, degradation of palmitic acid moiety by, 1261
Micrococcus cryophilus, lack of flagellation of, 1258
Microimmunodiffusion, improved matrix for, 232

Milk proteins, hydrolysis by *Streptococcus lactis*, 49
Mima-Herellea group, serology of, 900
Mineral deficiencies, in formation of resistant forms of *Azotobacter*, 684
Mitochondrial stabilizers, effect on immunogenicity of particulate fractions from *Mycobacterium tuberculosis*, 1346
Mitomycin A, biosynthesis of, 247
Mixed cultures, effect of environment on, 527
Monkeypox virus, identification by plaque morphology, 238
Moraxella, serology of, 900
Morphogenesis in *Arthrobacter crystallopoietes*, 924
Morphogenesis in *Myxococcus xanthus*, 316
Morphology of *Arthrobacter globiformis*, effect of biotin deficiency on, 641
Mucor racemosus, phosphorus compounds in, 150
Murine cells, behavior of Coxsackie A6 virus in, 969
Mutant, prototrophic, of *Escherichia coli*, 1051
Mutant of *Cellvibrio gilvus*, pigment in, 39
Mutants, auxotrophic, of *Bacillus megaterium*, 1118
Mutants, *Bacillus licheniformis*, 519
Mutants, *Bacillus megaterium*, isolation with 5-fluorouracil, 1137
Mutants, *Escherichia coli*, 341
Mutants, *Escherichia coli*, resistance to proflavine, 536
Mutants, *Escherichia coli*, valine-resistant, 566
Mutants, *Neurospora crassa*, β-glucosidase activity of, 761
Mutants, *Streptococcus faecalis*, folic acid metabolism in, 786
Mutants, *Streptococcus faecalis*, repression of synthetase by adenine, 792
Mutants, *Streptomyces scabies*, recombination of, 1281
Mutation in *Escherichia coli*, 802
Mutational sites of pneumococcus and streptococcus, 86
Mutational synergism, between radiations and methylated purines, 61
Mycobacillin, new antifungal peptide, 1397, 1402
Mycobacteria, biosynthesis of ergothioneine and hercynine, 852
Mycobacteria, cytochromes in, 1383
Mycobacteria, interrelationships with nocardiae, 1056
Mycobacterium ranae, bound intracellular acids in, 1528
Mycobacterium smegmatis, role in antigenic evolution of Actinomycetales, 1234
Mycobacterium tuberculosis, immunogenic substance from, 278
Mycobacterium tuberculosis, immunogenicity of particulate fractions from, 1346
Mycobacterium tuberculosis, inhibition by oxygen, 838
Mycobactin, bioassay with *Arthrobacter terregens*, 1317
Mycoplasma, storage of, 588
Mycoplasma laidlawii var. *inocuum* comb. nov., isolation of, 1245
Mycoplasma pneumoniae, agglutination of, 478
Myrica cerifera, endophyte of, 416
Myxococcus xanthus, electron transport system in, 316
Myxoma virus, structure of, 454

N-acetylhexosaminidase, fungal, effect on *Staphylococcus aureus*, 432
N-methyl groups, in bacterial lipids, 8
Neisseria gonorrhoeae, fine structure of, 1477
Neisseria gonorrhoeae, L-type growth in, 1471
Neuraminidase, activity in viral growth cycle, 363
Neurospora crassa, β-glucosidase system of, 761
Nitrate reduction, effect of hemin and oxygen tension on, 1406
Nitrous acid, *Escherichia coli* resistance to, 1094
Nocardiae, interrelationships with mycobacteria, 1056
Nodulating bacteria, classification of, 547
Nonphotoreactivability, correlation with transformability, 1295
Nuclear bodies, isolation in *Bacillus megaterium*, 1202
Nucleic acid, role in biosynthesis of mycobacillin, 1397
Nucleic acid analogues, in viral replication, 446
Nutrition of *Veillonella*, 574
Nutritional control of *Arthrobacter crystallopoietes*, 924
Nutritional decarboxylase production by *Lactobacillus*, 370
Nutritional requirements of *Bacillus popilliae*, 114

O antigens, structure and function of, 809
Oxamic transcarbamylase, of *Streptococcus allantoicus*, 75
Oxygen inhibition of *Mycobacterium tuberculosis* growth, 838
Oxygen tension, effect on growth of bacteria, 1406

Palmitic acid carbon in palmitates formed by *Micrococcus cerificans*, 1261
Pasteurella tuberculosis, pH 6 antigen in, 236
Penicillin, action on *Bacillus megaterium*, 1044
Penicillin resistance in transformed *Bacillus subtilis*, 867
Penicillinase production in *Staphylococcus aureus*, 593
Pertussis vaccine, stabilization of, 543
pH 6 antigen, in *Pasteurella pseudotuberculosis*, 236
Phage, *see* Bacteriophage

Phagocytosis of *Staphylococcus aureus*, 311
Phenol-adapted bacteria, metabolism of aromatic compounds by, 910
Phosphate-deficient medium, growth of *Escherichia coli* in, 779
Phosphoglucosaminisomerase, isolation from *Proteus vulgaris*, 1123
Phosphorus compounds, in *Mucor racemosus*, 150
Phospholipids, in *Bacillus polymyxa*, 16
Phospholipids, of *Streptococcus lactis*, 1531
Pigment, green fluorescent, in *Cellvibrio gilvus* mutant, 39
Pigmentation of *Xanthomonas*, 293
Plaque assay for psittacosis virus, 1503
Plaque formation of infectious bovine rhinotracheitis virus, 446
Pleuropneumonia-like organisms, effect of tetracycline on, 237
Pneumococcal cultures, synchronized for competence to transform, 1211
Pneumococci, deoxyribonucleic acid synthesis in, 1245
Pneumococcus, mutational site linkage to streptococcus, 86
Poliovirus particles, heterogeneity of, 1105
Poliovirus ribonucleic acid, increase of infectivity with histone, 964
Polyanions, effect on *Diplococcus pneumoniae*, 972
Polysaccharide, capsular, biosynthesis of, 461
Polysaccharide, metabolism by *Streptococcus mitis*, 1512
Potassium, effect on bacterial cell membranes, 1266
Potassium ions, concentration in a marine pseudomonad, 510
Potassium release by hemolysis of red cells, 145
Poultry, *Bacteroides*-like organism in, 737
Precipitin tests for enteroviruses and influenza B virus, 1171
Proflavine, *Escherichia coli* resistance to, 536
Proline oxidases in *Hansenula subpelliculosa*, 1462
Propionate oxidation by *Rhizobium meliloti*, 746
Propionibacteria, enzymes from, 171
Propionic acid fermentation, enzymes in, 171
Proteinase, extracellular, of *Streptococcus lactis*, 49
Proteins of *Pseudomonas aeruginosa*, 630
Proteus, transfer of F-linked determinants to, 209
Proteus vulgaris, degradation of glucosamine-6-phosphate by, 1123
Proteus vulgaris, synthesis of *N*-methylethanolamine, 8
Protoplasts, sporulation in, 667
Protoplasts of *Brucella*, 438
Protoplasts of *Staphylococcus aureus*, 432
Pseudomonads, marine, cell-wall composition of, 696
Pseudomonad, marine, sodium and potassium ions in, 510
Pseudomonas aeruginosa, bacteriophages from, 196, 973
Pseudomonas aeruginosa, dissociation in, 1003
Pseudomonas aeruginosa, from cystic fibrosis patients, 427
Pseudomonas aeruginosa, plaque formation by, 1254
Pseudomonas aeruginosa, proteins of, 630
Pseudomonas aeruginosa, viability of, 1253
Pseudomonas saccharophila, synthesis of α-amylase in, 1355
Psittacosis virus, plaque assay for, 1503
Psychrophiles, obligately anaerobic, isolation of, 562
Pyocyanin formation by *Pseudomonas aeruginosa*, 1254
Pyruvate, incorporation of formate, 97, 104
Pyruvate transport, role of lipoic acid in, 1529

Rabbit pox virus, selective system for, 481
Radiation, *Escherichia coli* resistance to, 1094
Radiation sensitivity of *Escherichia coli*, gene control of, 720
Resistance transfer factor, recombination with chromosome, 1339
Respiratory pathways of *Bacillus cereus*, 387
RHF-1 cells, induced resistance to vaccinia virus, 24
Rhizobium japonicum, classification of strains, 547
Rhizobium meliloti, propionate oxidation by, 746
Rhizopus nigricans, isocitratase formation, 156
Riboflavine, production by coliform bacteria, 337
Ribonucleic acid, accumulation in *Bacillus megaterium*, 755
Ribonucleic acid, biosynthesis in mammalian cells, 977
Ribonucleic acid, poliovirus, increase of infectivity with histone, 964
Ribonucleic acid, synthesis by X-irradiated bacteria, 1369
Ribonucleic acid synthesis, stimulation by zinc, 156
Ribonucleic acids of *Bacillus subtilis* spores, 323
Root nodule symbiosis, 416
Rumen butyrivibrio, strain variation, 1304

Saccharomyces carlsbergensis, amino acid release, 1389
Saccharomyces cerevisiae, methionine-activating enzyme in, 920
Saccharomyces cerevisiae, porosity of cell walls of 945
Salinity, soil, effect on *Coccidioides immitis*, 500
Salmonella enteritidis, endotoxin from, 371
Salmonella gallinarum, fructose-6-phosphate reductase from, 614
Salmonella grabouw, new species, 479
Salmonella lexington, antigenic constitution of, 1248

Salmonella rubislaw, flagellar antigens of, 967
Salmonella typhimurium, genetic basis of mouse virulence, 598
Salmonella typhosa, genetic crosses with *Escherichia coli*, 54
Sarcina ureae endospores, germination of, 235
Seawater, *Escherichia coli* growth in, 483
Sepedonium, differentiation from *Histoplasma capsulatum*, 120
Serratia marcescens endotoxin, inactivation by guinea-pig liver, 832
Serum bactericidal reactions, stages in, 1067
Sexual agglutination of *Hansenula wingei*, 863
Shigella, mixed culture with *Klebsiella*, 527
Slime-mold development, serological analyses of, 1321
Sodium, effect on bacterial cell membranes, 1266
Sodium ions, concentration in a marine pseudomonad, 510
Soil, growth of *Coccidioides immitis* in, 500
Sphaerotilus, requirement for cyanocobalamin, 286
Spheroplast formation in *Bacillus cereus*, 581
Spheroplasts, *Brucella*, production of, 438
Spheroplasts, *Brucella suis*, fine structure of, 1492
Spherules of *Coccidioides immitis*, cultivation of, 468
Spirochetes, anaerobic, isolation and growth of, 1521
Spores, *Bacillus cereus*, germination of, 1129
Spores, *Bacillus megaterium*, effect of sporulation medium on, 876
Spores, *Bacillus polymyxa*, phospholipids in, 16
Spores, *Bacillus subtilis*, incorporation of bacteriophage genome by, 1499
Spores, *Bacillus subtilis*, medium for, 332
Spores, *Bacillus subtilis*, ribonucleic acids of, 323
Spores, effect of temperature on germination, 619
Spores, formation in *Bacillus cereus*, 1221
Spores, heat resistance related to lipids, 16
Spores, rupture in presence of salt, 952
Spores, *Sarcina ureae*, germination of, 235
Sporogenesis of *Bacillus subtilis*, enzyme activity during, 701
Sporulation in protoplasts, 667
Sporulation of *Bacillus cereus*, 1087
Staphylococcal alpha-toxin, hemolysis of rabbit erythrocytes by, 127, 136, 145
Staphylococcal enterotoxin, pyrogenic and emetic properties of, 1019
Staphylococci, methicillin-resistant, 887
Staphylococcus, induced synergistic hemolysis, 188
Staphylococcus aureus, carbohydrate-utilizing, medium for, 1198
Staphylococcus aureus, effect of methicillin on, 690
Staphylococcus aureus, penicillinase production in, 593
Staphylococcus aureus, phagocytosis of, 311
Staphylococcus aureus, treatment with fungal *N*-acetylhexosaminidase, 432
Staphylococcus aureus L forms, growth of, 1192
Staphylococcus enterotoxin B, resistance of bacteria to, 971
Staphylococcus epidermidis, effect of methicillin on, 690
Storage of *Mycoplasma* strains, 588
Streptococcal infection, susceptibility of inbred mice to, 1457
Streptococci, beta-hemolytic, grouping of, 227
Streptococci, group A, absence of M antigen from, 1251
Streptococci, group A, host-parasite relationships among, 1452, 1457
Streptococci, group A, typing by immunofluorescence, 1377
Streptococci, pleomorphism in, 961
Streptococcus, mutational site linkage to pneumococcus, 86
Streptococcus allantoicus, glyoxylate fermentation by, 241
Streptococcus allantoicus, oxamic transcarbamylase of, 75
Streptococcus faecalis, arginine as energy source for growth of, 988
Streptococcus faecalis, endogenous metabolism in, 256
Streptococcus faecalis, formate-pyruvate exchange reaction in, 97, 104
Streptococcus faecalis, 2-ketogluconate fermentation by, 844
Streptococcus faecalis, transport of citrulline in, 815
Streptococcus faecalis mutants, folic acid metabolism in, 786
Streptococcus faecalis mutants, repression of synthetase by adenine, 792
Streptococcus lactis, extracellular proteinase of, 49
Streptococcus lactis, phospholipids of, 1531
Streptococcus mitis, inducible enzyme formation by, 1512
Streptococcus pyogenes L forms, growth of, 1242
Streptomyces scabies, tyrosinase inheritance, 1281, 1287
Streptomyces venezuelae, bacteriophage of, 1157
Streptomyces verticillatus, synthesis of mitomycin, 247
Streptomycin, bactericidal effect of, 606
Streptomycin dependence, relation to biosynthesis of mycobacillin, 1402
Streptomycin resistance, *Escherichia coli* mutation to, 61
Succinic acid degradation by *Veillonella alcalescens*, 1527
Sulfate-reducing bacteria, deoxyribonucleic acid from, 1073

Sulfonamide resistance of *Clostridium sporogenes*, 1526
Surfactants, nonionic, effect on bacteriophage infections, 933
Synergistic hemolysis in *Staphylococcus* species, 188

T_2 coliphage infection, effect of Triton WR-1339 on, 933
Tetracycline, effect on pleuropneumonia-like organisms, 237
Tetracycline, effect on ribonucleic acid distribution, 755
Thymidine, incorporation into pneumococcal deoxyribonucleic acid, 1211
Thymine gene in *Escherichia coli*, 554
Thymineless death in *Bacillus megaterium*, 1079, 1118
Thymineless mutation site on *Escherichia coli* chromosome, 802
Tissue culture system for assay of psittacosis virus, 1503
Tissue reactions after *Coccidioides immitis* vaccination, 1216
Torulopsis famata, growth with *Acanthamoeba castellani*, 220
Torulopsis glabrata, inhibition of growth, 1
Toxins, bacterial, lysosomal disruption by, 1100
Trachoma agent, indirect hemagglutination with, 1251
Transaminases, radiosensitivity during sporogenesis, 701
Transduction of penicillin resistance in *Staphylococcus aureus*, 593
Transformatility, correlation with nonphotoreactivability, 1295
Transformation of *Bacillus licheniformis*, 519
Treponema microdentium, ultrastructure of, 1180
Trypsin activation of botulinus toxin, 401
Tryptophan-excreting mutant of *Escherichia coli*, 1051
Typhoid immunity, diffusion chamber in study of, 975
Tyrosinase inheritance in *Streptomyces scabies*, 1281, 1287

Ultrastructure of oral spirochetes, 1180
Uracil synthesis, control by arginine, 1436
Uranyl ion, use in membrane transport studies, 232
Uric acid, effect on riboflavine production, 337
Uric acid-fed chicks, effect of dietary antibiotics on, 329

Voges-Proskauer test, techniques for, 234
Vaccine, viable, for coccidioidomycosis, 81
Vaccinia virus, interference by adenovirus, 24
Valine, biosynthesis in *Escherichia coli*, 566
Vancomycin, action on *Bacillus megaterium*, 1044
Vegetative cells, L-alanine dehydrogenase from, 68
Veillonella, characterization of the genus, 162
Veillonella, nutrition of, 574
Veillonella alcalescens, succinic acid degradation by, 1527
Vibrios, El Tor, isolation of, 1249
Vibrios, microaerophilic, growth of, 352
Viologen dye inhibition of methane formation, 993
Viral growth cycle, neuraminidase in, 363
Virulence of *Salmonella typhimurium*, 598
Virus, Coxsackie A6, behavior in murine cells, 969
Virus, fowlpox, composition of, 939
Virus, herpes simplex, effect of heparin on, 1060
Virus, Japanese encephalitis, assay of 1239
Virus, rabbit pox, selective system for, 481
Virus complement-fixation and neutralization with baboon sera, 744
Virus infection, effect of nutritional deficiencies on, 609
Virus plaque assay, on mouse embryo cells, 1238
Virus replication, infectious bovine rhinotracheitis, 446
Viruses, microdiffusion precipitin test for, 1171
Viruses, associated with *Pseudomonas aeruginosa*, 196

Wound exudates, clostridial toxins in, 623

Xanthomonas, taxonomy of, 293

Yeast growth, inhibition by mouse ascites fluid, 1
Yeasts, assimilation of alkanes and alkenes, 968

Zinc, effect on *Escherichia coli* growth, 823

INDEX TO DATE OF ISSUE

Month	Date of Issue	Pages
January	1/27/64	1–240
February	2/24/64	241–482
March	3/18/64	483–750
April	4/29/64	751–976
May	5/20/64	977–1260
June	6/19/64	1261–1548

JOURNAL

OF

BACTERIOLOGY

VOLUME 87

BALTIMORE, MD.
1964

EDITORIAL BOARD

William B. Sarles, *Editor*
Department of Bacteriology, University of Wisconsin, Madison 6, Wisconsin

Edward A. Adelberg (1964) ..... Yale University, New Haven, Connecticut
Robert Austrian (1969) ..... Hospital of the University of Pennsylvania, Philadelphia, Pa.
S. S. Barkulis (1969) ..... CIBA Pharmaceutical Products, Inc., Summit, N.J.
L. J. Berry (1967) ..... Bryn Mawr College, Bryn Mawr, Pennsylvania
S. Gaylen Bradley (1969) ..... University of Minnesota, Minneapolis, Minn.
Allan Campbell (1969) ..... University of Rochester, Rochester, N.Y.
L. Leon Campbell, Jr. (1966) ..... University of Illinois, Urbana, Illinois
George B. Chapman (1964) ..... Georgetown University, Washington, D.C.
Robert C. Cleverdon (1967) ..... University of Connecticut, Storrs, Conn.
C. D. Cox (1966) ..... University of Massachusetts, Amherst, Mass.
William J. Cromartie (1969) ..... University of North Carolina School of Medicine, Chapel Hill, N.C.
A. L. Demain (1969) ..... Merck, Sharp & Dohme & Co., Inc., Rahway, N.J.
John A. DeMoss (1969) ..... University of California, San Diego, La Jolla, Calif.
R. D. DeMoss (1964) ..... University of Illinois, Urbana, Illinois
Michael Doudoroff (1969) ..... University of California, Berkeley, Calif.
C. W. Emmons (1966) ..... National Institutes of Health, Bethesda, Maryland
Ellis Englesberg (1969) ..... University of Pittsburgh, Pittsburgh, Pa.
Frank B. Engley, Jr. (1969) ..... University of Missouri, Columbia, Mo.
E. Edward Evans (1966) ..... University of Alabama Medical Center, Birmingham, Ala.
A. E. Feller (1965) ..... University of Virginia School of Medicine, Charlottesville, Virginia
William W. Ferguson (1969) ..... Michigan Department of Health, Lansing, Michigan
Harold S. Ginsberg (1964) ..... University of Pennsylvania School of Medicine, Philadelphia, Pa.
Ruth E. Gordon (1966) ..... Rutgers, The State University, New Brunswick, N.J.
Elliot Juni (1967) ..... Emory University, Atlanta, Georgia
R. E. Kallio (1969) ..... State University of Iowa, Iowa City, Iowa
J. O. Lampen (1965) ..... Rutgers, The State University, New Brunswick, N.J.
Einar Leifson (1966) ..... Loyola University School of Medicine, Chicago, Illinois
H. C. Lichstein (1965) ..... University of Cincinnati College of Medicine, Cincinnati, Ohio
Elizabeth McCoy (1969) ..... University of Wisconsin, Madison, Wis.
Evelyn L. Oginsky (1969) ..... University of Oregon Medical School, Portland, Oregon
James T. Park (1969) ..... Tufts University, Boston, Mass.
Michael J. Pelczar, Jr. (1969) ..... University of Maryland, College Park, Md.
H. J. Phaff (1964) ..... University of California, Davis, California
A. F. Rasmussen (1964) ..... University of California School of Medicine, Los Angeles, California
Roy Repaske (1969) ..... National Institutes of Health, Bethesda, Maryland
C. F. Robinow (1966) ..... University of Western Ontario, London, Ontario, Canada
W. R. Romig (1969) ..... University of California, Los Angeles, Calif.
Harry M. Rose (1964) ..... Columbia University College of Physicians and Surgeons, New York, N.Y.
Louis DS. Smith (1968) ..... Montana State College, Bozeman, Montana
John Spizizen (1964) ..... University of Minnesota, Minneapolis, Minnesota
Curtis B. Thorne (1966) ..... MB Division, Fort Detrick, Frederick, Md.
Lewis W. Wannamaker (1969) ..... University of Minnesota, Minneapolis, Minn.
J. B. Wilson (1969) ..... University of Wisconsin, Madison, Wis.
Charles Yanofsky (1964) ..... Stanford University, Stanford, California

Robert A. Day, *Managing Editor*, 115 Huron View Boulevard, Ann Arbor, Michigan

EX OFFICIO

J. R. Porter, *President* (1963–1964) ..... State University of Iowa, Iowa City, Iowa
Orville Wyss, *Vice-President* (1963–1964) ..... University of Texas, Austin, Texas
Philipp Gerhardt, *Secretary* ..... The University of Michigan, Ann Arbor, Michigan
Richard Donovick, *Treasurer* ..... The Squibb Institute for Medical Research, New Brunswick, N.J.

Copyright © 1964, American Society for Microbiology

CONTENTS

No. 1, JANUARY 1964

In Vitro Inhibition of Yeast Growth by Mouse Ascites Fluid and Serum. Donald F. Summers and H. F. Hasenclever 1
N-Methyl Groups in Bacterial Lipids. Howard Goldfine and Martha E. Ellis 8
Phospholipids in Vegetative Cells and Spores of *Bacillus polymyxa*. Jack R. Matches, Homer W. Walker, and John C. Ayres 16
Interference Induced Against Vaccinia in an Adenovirus-RHF-1 System. Newton Khoobyarian 24
Intracellular Behavior of *Histoplasma capsulatum*. Dexter H. Howard 33
Green Fluorescent Pigment Accumulated by a Mutant of *Cellvibrio gilvus*. Samuel H. Love and Frank H. Hulcher 39
Medium for Differentiating the Gram-Negative, Nonfermenting Bacilli of Medical Interest. Walter Sellers 46
Extracellular Proteinase of *Streptococcus lactis*. W. T. Williamson, S. B. Tove, and M. L. Speck 49
Recipient Ability of *Salmonella typhosa* in Genetic Crosses With *Escherichia coli*. E. M. Johnson, Stanley Falkow, and L. S. Baron 54
Mutational Synergism Between Radiations and Methylated Purines in *Escherichia coli*. Ira N. Doneson and Delbert M. Shankel 61
Purification and Properties of L-Alanine Dehydrogenase from Vegetative Cells of *Bacillus cereus*. Neil G. McCormick and Harlyn O. Halvorson 68
Oxamic Transcarbamylase of *Streptococcus allantoicus*. R. Bojanowski, Elizabeth Gaudy, R. C. Valentine, and R. S. Wolfe 75
Experimental Primary Cutaneous Coccidioidomycosis in the Monkey. John L. Converse, Steven P. Pakes, Ernest M. Snyder, and Merida W. Castleberry 81
Genetic Linkage of Mutational Sites Affecting Similar Characters in Pneumococcus and Streptococcus. Arnold W. Ravin and Joscelyn D. H. De Sa 86
Formate-Pyruvate Exchange Reaction in *Streptococcus faecalis*. I. Factor Requirement for Intact Cells. N. P. Wood and D. J. O'Kane 97
Formate-Pyruvate Exchange Reaction in *Streptococcus faecalis*. II. Reaction Conditions for Cell Extracts. M. O. Oster and N. P. Wood 104
Nutritional Requirements of *Bacillus popilliae*. Charles J. Sylvester and Ralph N. Costilow 114
Fluorescent-Antibody Studies of the Mycelial Form of *Histoplasma capsulatum* and Morphologically Similar Fungi. Leo Kaufman and Brenda Brandt 120
Hemolysis of Rabbit Erythrocytes by Purified Staphylococcal Alpha-Toxin. I. Kinetics of the Lytic Reaction. Louis Z. Cooper, Morton A. Madoff, and Louis Weinstein 127
Hemolysis of Rabbit Erythrocytes by Purified Staphylococcal Alpha-Toxin. II. Effects of Inhibitors on the Hemolytic Sequence. Louis Z. Cooper, Morton A. Madoff, and Louis Weinstein 136
Hemolysis of Rabbit Erythrocytes by Purified Staphylococcal Alpha-Toxin. III. Potassium Release. Morton A. Madoff, Louis Z. Cooper, and Louis Weinstein 145
Accumulation of Phosphorus Compounds by *Mucor racemosus*. A. W. James and L. E. Casida, Jr. 150
Control of Isocitratase Formation in *Rhizopus nigricans*. Warner S. Wegener and Antonio H. Romano 156
The Genus *Veillonella*. I. General Cultural, Ecological, and Biochemical Considerations. M. Rogosa 162
Purification and Properties of Enzymes Involved in the Propionic Acid Fermentation. S. H. G. Allen, R. W. Kellermeyer, R. L. Stjernholm, and Harland G. Wood 171
Demonstration of Induced Synergistic Hemolysis by "Nonhemolytic" *Staphylococcus* Species. Doyle C. Smith, V. D. Foltz, and T. H. Lord 188
Isolation and Preliminary Characteristics of Three Bacteriophages Associated With a

Lysogenic Strain of *Pseudomonas aeruginosa*. Thomas W. Feary, Earl Fisher, Jr., and Thelma N. Fisher 196
Transfer of Episomic Elements to *Proteus*. I. Transfer of F-Linked Chromosomal Determinants. Stanley Falkow, J. A. Wohlhieter, R. V. Citarella, and L. S. Baron 209
Growth of *Acanthamoeba castellani* with the Yeast *Torulopsis famata*. L. C. Nero, Mae G. Tarver, and L. R. Hedrick 220

NOTES:

Localization of Cell-Bound α-Amylase in *Aspergillus oryzae* Demonstrated by Fluorescent-Antibody Technique. Kenzo Tonomura and Osamu Tanabe 226
Grouping of Beta-Hemolytic Streptococci on Cellulose Acetate Membranes. M. Goldin and Arleen Glenn 227
Some Observations on the Cytology of *Candida albicans*. Alexander Bakerspigel 228
Methods for Isolation and Purification of *Chondromyces*. Lois F. Nellis and Harold R. Garner 230
Improved Matrix for Microimmunodiffusion. Harold Markowitz 232
Use of Uranyl Ion in Membrane Transport Studies. Vincent P. Cirillo and Peter O. Wilkins 232
Voges-Proskauer Test: Expeditious Techniques for Routine Use. M. Aaron Benjaminson, Bienvenido C. de Guzman, and Alfred J. Weil 234
Germination System for Endospores of *Sarcina ureae*. John J. Landolo and Z. John Ordal 235
The pH 6 Antigen in Strains of *Pasteurella pseudotuberculosis* and Its Relation to Biological Activities. Shlomo Ben-Efraim and Leah Bichowsky-Slomnichi 236
Elimination of Pleuropneumonia-like Organisms from Embryonic Human Lung Tissue Culture with Tetracycline. Lawrence E. Hooser, Eldon V. Davis, Marian L. Moore, and Robert A. Siem 237
Isolation of *Bacillus anthracis* from Soil Stored 60 Years. J. B. Wilson and Kay E. Russell 237
Plaque Morphology of Monkeypox Virus as an Aid to Strain Identification. S. J. McConnell, R. O. Spertzel, D. L. Huxsoll, L. H. Elliott, and R. H. Yager 238
Erratum 240

No. 2, February 1964

Glyoxylate Fermentation by *Streptococcus allantoicus*. R. C. Valentine, H. Drucker, and R. S. Wolfe 241
Influence of Biological Methylation on the Biosynthesis of Mitomycin. A. E. J. Kirsch and J. D. Korshalla 247
Anaerobic Endogenous Metabolism in *Streptococcus faecalis*. D. J. Walker and W. W. Forrest 256
Unidentified Growth Factor for a Lactic Acid Bacterium. Donald E. Weinman, George K. Morris, and William L. Williams 263
Metabolism of Dicarboxylic Acids in *Acetobacter xylinum*. Moshe Benziman and A. Abeliovitz 270
Further Studies on a Labile Immunogenic Particulate Substance Isolated From *Mycobacterium tuberculosis*. Anne S. Youmans and Guy P. Youmans 278
Requirement of *Sphaerotilus* for Cyanocobalamin. Harold Okrend and Norman C. Dondero 286
Pigmentation and Taxonomy of the Genus *Xanthomonas*. Mortimer P. Starr and William L. Stephens 293
Glucose Catabolism by *Bacillus popilliae and Bacillus lentimorbus*. Rollin E. Pepper and Ralph N. Costilow 303
In Vitro Phagocytosis of *Staphylococcus aureus* With Special Reference to a Possible Antiphagocytic Function of Coagulase. Kenneth A. Borchardt and William A. Pierce, Jr. 311
Electron Transport System in Vegetative Cells and Microcysts of *Myxococcus xanthus*. Martin Dworkin and Donald J. Niederpruem 316

Ribonucleic Acids of *Bacillus subtilis* Spores and Sporulating Cells. Roy H. Doi and Richard T. Igarashi 323
Effect of Dietary Antibiotics Upon Coliform Bacteria and Lactobacilli in the Intestinal Tract of Uric-Fed Chicks. L. N. Bare, R. F. Wiseman, and O. J. Abbott 329
Chemically Defined, Synthetic Media for Sporulation and for Germination and Growth of *Bacillus subtilis*. J. Edward Donnellan, Jr., Ella H. Nags, and Hillel S. Levinson 332
Effect of Uric Acid on Riboflavine Production by Intestinal Coliform Bacteria. H. S. Lau and R. F. Wiseman 337
Effect of Drug-Resistance Factor R on the F Properties of *Escherichia coli*. Yukinori Hirota, Yukinobu Nishimura, Frits Ørskov, and Ida Ørskov 341
Gaseous Environment and Growth of Microaerophilic Vibrios. R. D. Fletcher and W. N. Plastridge 352
Effect of the Temperature of Growth of *Escherichia coli* on the Formation of β-Galactosidase. Allen G. Marr, John L. Ingraham, and Craig L. Squires 356
Enzymatic Variants of Influenza Virus. III. Function of Neuraminidase in the Viral Growth Cycle. Billie L. Padgett and Duard L. Walker 363
Nutritional Requirements of Lactobacillus 30a for Growth and Histidine Decarboxylase Production. Beverly M. Guirard and Esmond E. Snell 370
Pathways of Glucose Catabolism in *Bacillus cereus*. Manuel Goldman and Harold J. Blumenthal 377
Changes in Terminal Respiratory Pathways of Intact Cells of *Bacillus cereus* at Various Stages of Development. Manuel Goldman and Harold J. Blumenthal 387
Extraction and Purification of Endotoxin From Enterobacteriaceae: a Comparison of Selected Methods and Sources. K. Fukushi, R. L. Anacker, W. T. Haskins, M. Landy, K. C. Milner, and E. Ribi 391
Comparative Gel Filtration of Toxin Precursor and Trypsin-Activated Toxin of *Clostridium botulinum* Type E. Genji Sakaguchi, Sumiko Sakaguchi, and Nobuko Imai 401
Isolation and Characterization of Bacteriophages Active on *Clostridium sporogenes*. John V. Betz and Kenneth E. Anderson 408
Root Nodule Symbiosis. I. Endophyte of *Myrica cerifera* L. Warren S. Silver 416
5-Fluorouracil as a Selective Agent for Growth of Leptospirae. Russell C. Johnson and Palmer Rogers 422
Comparison of Some Properties of *Pseudomonas aeruginosa* Isolated From Infections in Persons with and without Cystic Fibrosis. Robert G. Doggett, Gunyon M. Harrison, and Everett S. Wallis 427
Formation of "Protoplasts" of *Staphylococcus aureus* With a Fungal *N*-Acetylhexosaminidase. John H. Hash, Marcia Wishnick, and Philip A. Miller 432
Production and Characterization of *Brucella* Spheroplasts. William D. Hines, Bob A. Freeman, and Gary R. Pearson 438
Infectious Bovine Rhinotracheitis Virus Replication, Cytopathology, and Plaque Formation in the Presence and Absence of Nucleic Acid Analogues. Jack G. Stevens and Neal B. Groman 446
Electron Microscopic Structure of Myxoma Virus and Some Reactivable Derivatives. Billie L. Padgett, Margaret J. Wright, Anne Jayne, and Duard L. Walker 454
Pathways for Biosynthesis of a Bacterial Capsular Polysaccharide. IV. Capsule Resynthesis by Decapsulated Resting-Cell Suspensions. Elliot Juni and Gloria A. Heym 461
Continuous In Vitro Cultivation of Spherules of *Coccidioides immitis*. Abraham M. Breslau and Mike Y. Kubota 468

NOTES:

Quantitative Rapid Immunofluorescence Microscopy. I. Instrumentation. H. P. Hovnanian, T. A. Brennan, and E. A. Botan 473
Improved Stain for Visualization of *Azotobacter* Encystment. G. R. Vela and Orville Wyss 476

Simple and Sensitive Method for Demonstrating Mercaptan Production by Microorganisms. Warren P. Iverson 478
Rapid Specific Agglutination of Eaton Agent (*Mycoplasma pneumoniae*). K. M. Kerr, C. C. Mascoli, N. O. Olson, and A. Campbell 478
Salmonella grabouw: 11:g, m, s, t: z_{39} , a New Species. H. D. Brede 479
New Selective System for Rabbit Pox Virus. Edward H. Simon 481
Erratum 482

No. 3, March 1964

Effect of Chelating Agents on the Growth of *Escherichia coli* in Sea Water. Galen E. Jones 483
Significance of Soil Salinity on the Ecology of *Coccidioides immitis*. Ann F. Elconin, Roger O. Egeberg, and Margaret C. Egeberg 500
Factors Affecting the Formation of Cobamide Coenzymes in *Clostridium tetanomorphum*. J. I. Toohey and H. A. Barker 504
Nutrition and Metabolism of Marine Bacteria. XIII. Intracellular Concentrations of Sodium and Potassium Ions in a Marine Pseudomonad. Frank P. Takacs, Tibor I. Matula, and Robert A. MacLeod 510
Transformation of *Bacillus licheniformis*. Darrel D. Gwinn and Curtis B. Thorne 519
Ecological Factors Influencing the Relationships Between *Klebsiella* and *Shigella* in Mixed Culture. David J. Hentges and MacDonald Fulton 527
Resistance and Cross-Resistance of *Escherichia coli* S Mutants to the Radiomimetic Agent Proflavine. Pearl Woody-Karrer and Joseph Greenberg 536
Stabilization of Pertussis Vaccine in the Presence of Benzethonium Chloride. B. H. Olson, Grace Eldering, and Bernice Graham 543
Quick Serological Method of Classifying Strains of *Rhizobium japonicum* in Nodules. Ura M. Means, Herbert W. Johnson, and R. A. Date 547
Chromosomal Location of Thymine and Arginine Genes in *Escherichia coli* and an F′ Incorporating Them. Masahide Ishibashi, Yoshinobu Sugino, and Yukinori Hirota 554
Isolation of Obligately Anaerobic Psychrophilic Bacteria. N. A. Sinclair and J. L. Stokes 562
Regulatory Mechanisms in the Biosynthesis of Isoleucine and Valine. I. Genetic Derepression of Enzyme Formation. T. Ramakrishnan and Edward A. Adelberg 566
The Genus *Veillonella*. II. Nutritional Studies. M. Rogosa and Ferial S. Bishop 574
Distribution of Radioactivity in Autolyzed Cell Wall of *Bacillus cereus* During Spheroplast Formation. Donald P. Kronish, Raam R. Mohan, and Benjamin S. Schwartz 581
Storage of *Mycoplasma* Strains. William H. Kelton 588
Nature of the Determinant Controlling Penicillinase Production in *Staphylococcus aureus*. Shirley A. Harmon and Jack N. Baldwin 593
Alterations in the Mouse Virulence of *Salmonella typhimurium* by Genetic Recombination. V. Krishnapillai and L. S. Baron 598
Macromolecular Synthesis and the Bactericidal Effect of Streptomycin. Herbert S. Rosenkranz 606
Amino Acid Requirements of Herpes Simplex Virus in Human Cells. Robert W. Tankersley, Jr. 609
Fructose-6-Phosphate Reductase From *Salmonella gallinarum*. Glaci T. Zancan and Metry Bacila 614
Effect of Temperature on the Rate of Germination in *Bacillus cereus*. Georges Knaysi 619
Analyses of Wound Exudates for Clostridial Toxins. Howard E. Noyes, William L. Pritchard, Floyd B. Brinkley, and Janice A. Mendelson 623
"Cell Wall Protein A" of *Pseudomonas aeruginosa* and Its Relationship to "Original Endotoxin Protein." J. Yuzuru Homma and Nachiko Suzuki 630
Morphological Aberration of *Arthrobacter globiformis* Cells Due to Biotin Deficiency. E. C. S. Chan 641
Motile Marine Bacteria. I. Techniques, Ecology, and General Characteristics. Einar Leifson, B. J. Cosenza, R. Murchelano, and R. C. Cleverdon 652

Sporulation in Protoplasts and Its Dependence on Prior Forespore Development. Philip C. Fitz-James 667
Comparative Studies of *Francisella tularensis* and *Francisella novicida*. C. R. Owen, E. O. Buker, W. L. Jellison, D. B. Lackman, and J. F. Bell 676
Natural Factors Involved in the Induction of Cyst Formation in *Azotobacter*. Joseph S. Layne and Emmett J. Johnson 684
Methicillin-Induced Lysozyme-Sensitive Forms of Staphylococci. K. M. Aldrich and C. P. Sword 690
Cell-Wall Composition and Osmotic Fragility of Selected Marine Bacteria. I. J. Sud and M. E. Tyler 696
Radiosensitivity of Several Dehydrogenases and Transaminases During Sporogenesis of *Bacillus subtilis*. D. B. Rowley and H. R. Newcomb 701
Filament Formation by *Escherichia coli* at Increased Hydrostatic Pressures. Claude E. ZoBell and Andre B. Cobet 710
Analysis of a Gene Controlling Cell Division and Sensitivity to Radiation in *Escherichia coli*. Howard I. Adler and Alice A. Hardigree 720
New Type of Sex Factor-Specific Bacteriophage of *Escherichia coli*. Tsutomu Watanabe and Motoyuki Okada 727
Unusual Bacteroides-Like Organism. Herbert S. Goldberg, Ella M. Barnes, and Anthony B. Charles 737

NOTES:

Effect of 5-Bromodeoxyuridine on the Experimentally Induced Radioresistance of *Escherichia coli*. Luis V. Orce, Rita Lumi, Carlos Bobbi, and Dusan Kanazir 743
Virus Complement-Fixation and Neutralization Studies on Sera From the Normal Baboon (*Papio doguera*). S. S. Kalter, R. Fuentes-Marins, R. A. Crandell, A. R. Rodriguez, and A. Hellman 744
Effect of Cobalt on the Oxidation of Propionate by *Rhizobium meliloti*. A. A. De Hertogh, Patricia A. Mayeux, and Harold J. Evans 746
Enhanced Toxicity in Chemically Altered *Blastomyces dermatitidis*. John J. Taylor 748
Erratum 749

No. 4, April 1964

Obituary—William Mansfield Clark. W. Barry Wood 751
Accumulation of Ribonucleic Acid in Bacterial Nuclear Preparations During Treatment of Whole Cells With 8-Azaguanine, Tetracyclines, and Other Inhibitors. David H. Ezekiel 755
β-Glucosidase System of *Neurospora crassa*. I. β-Glucosidase and Cellulase Activities of Mutant and Wild-Type Strains. Bruce Eberhart, David F. Cross, and Lewis R. Chase 761
"Black Light" Inactivation of Transforming Deoxyribonucleic Acid From *Haemophilus influenzae*. Emiliano Cabrera-Juárez 771
Growth and Survival of *Escherichia coli* in Medium Limited in Phosphate. M. F. Mallette, Cynthia I. Cowan, and J. J. R. Campbell 779
Folic Acid Metabolism in Antifolic-Resistant Mutants of *Streptococcus faecalis*. Alva H. Johnson and Dorris J. Hutchison 786
Repression by Adenine of the Formyltetrahydrofolate Synthetase in an Antifolic-Resistant Mutant of *Streptococcus faecalis*. Alberta M. Albrecht and Dorris J. Hutchison 792
New Mode of Genetic Transfer in *Streptococcus faecalis* var. *liquefaciens*. Ruth E. Raycroft and L. N. Zimmerman 799
Thymineless Mutation Site on *Escherichia coli* Chromosome. Nobuo Kitsuji 802
Relationship of Structure to Function in Bacterial O Antigens. III. Biological Properties of Endotoxoids. Arthur G. Johnson and Alois Nowotny 809
Inducible Transport System for Citrulline in *Streptococcus faecalis*. William R. Bibb and W. R. Straughn 815

Effect of Iron and Zinc on Growth Patterns of *Escherichia coli* in an Iron-Deficient Medium. Colin Ratledge and Frank G. Winder 823
Preferential Synthesis of α-Amylase by *Bacillus stearothermophilus* in the Presence of 5-Methyl-Tryptophan. N. E. Welker and L. Leon Campbell 828
Nature of the Endotoxin-Inactivating Principle in Guinea-Pig Liver. Laurence M. Corwin and W. Edmund Farrar, Jr. 832
Oxygen Inhibition of Growth of *Mycobacterium tuberculosis*. Sheldon F. Gottlieb, Noel R. Rose, Jerome Maurizi, and Edward H. Lanphier 838
2-Ketogluconate Fermentation by *Streptococcus faecalis*. J. L. Goddard and J. R. Sokatch 844
Biosynthesis of Ergothioneine and Hercynine by Mycobacteria. Dorothy S. Genghof and Olga Van Damme 852
Specific, Soluble Factor Involved in Sexual Agglutination of the Yeast *Hansenula wingei*. Neil W. Taylor 863
Penicillin Resistance of Competent Cells in Deoxyribonucleic Acid Transformation of *Bacillus subtilis*. E. W. Nester 867
Effect of Sporulation Medium on Heat Resistance, Chemical Composition, and Germination of *Bacillus megaterium* Spores. Hillel S. Levinson and Mildred T. Hyatt 876
Characteristics of Methicillin-Resistant Staphylococci. R. Sutherland and G. N. Rolinson 887
Serology of the *Mima-Herellea* Group and the Genus *Moraxella*. Paul D. Mitchell and Robert G. Burrell 900
Microbial Metabolism of Aromatic Compounds. I. Decomposition of Phenolic Compounds and Aromatic Hydrocarbons by Phenol-Adapted Bacteria. Henry H. Tabak, Cecil W. Chambers, and Paul W. Kabler 910
Induction of the Methionine-Activating Enzyme in *Saccharomyces cerevisiae*. C. Jo-Anne Pigg, W. A. Sorsoli, and L. W. Parks 920
Nutritional Control of Morphogenesis in *Arthrobacter crystallopoietes*. Jerald C. Ensign and R. S. Wolfe 924
Influence of Nonionic Surfactants on Bacteriophage Infections. I. Effect of Triton WR-1339 on T_2 Coliphage Infection. Michael J. Rose, Jr., Stephen A. Aron, and Bernard W. Janicki 933
Composition of Fowlpox Virus and Inclusion Matrix. Charles C. Randall, Lanelle G. Gafford, Robert W. Darlington, and James Hyde 939
Porosity of Isolated Cell Walls of a Yeast and a Bacillus. Phillip Gerhardt and Jean A. Judge 945
Kinetics of Dry Rupture of Bacterial Spores in the Presence of Salt. L. E. Sacks, Peter B. Percell, Richard S. Thomas, and Glen F. Bailey 952

NOTES:

Anomalous Production of Pleomorphism in Strains of Streptococci. P. F. Southall and I. J. Slotnick 961
Simple Automatic Inoculator. D. C. Birdsell and C. H. Drake 962
Modernizing Brewer and Other Anaerobic Jars. O. Khairat 963
Dilution of Poliovirus Ribonucleic Acid as an Important Step in Obtaining Infectivity With Histone. Ernest H. Ludwig and Christine E. Smull 964
Chromatographic Analysis of the State of Association of the Dye-Iodine Complex in Decolorization Solvents of the Gram Stain. Carl Lamanna and M. F. Mallette 965
Salmonella rubislaw With Three "Normal" Flagellar Antigens. Alma C. McWhorter, Mary M. Ball, and Beverly O. Freeman 967
Assimilation of Alkanes and Alkenes by Yeasts. A. J. Markovetz and R. E. Kallio. 968
Behavior of Coxsackie A6 Virus in Murine Cells: Failure of Newer Techniques to Detect Multiplication In Vitro. J. W. St. Geme, Jr. 969
Resistance of Bacteria to Purified Staphylococcus Enterotoxin B. Donald T. Braymen 971
Influence of Polyanions on Growth and Deoxyribonucleic Acid Synthesis of *Diplococcus pneumoniae*. Theodore Small, Werner Braun, and William Firshein. 972

Phage-Host Relationships and Physical Characteristics of a *Pseudomonas aeruginosa* Bacteriophage. James B. Grogan and Emmett J. Johnson 973
Use of a Diffusion Chamber in Studies of Immunity of Experimental Typhoid. Takehisa Akiyama, Katsutoshi Maeda, and Daizo Ushiba 975
Erratum 976

No. 5, MAY 1964

Role of Ribonucleic Acid Biosynthesis in Multiplication of Type 5 Adenovirus. John F. Flanagan and Harold S. Ginsberg 977
Utilization of Arginine as an Energy Source for the Growth of *Streptococcus faecalis*. R. H. Deibel 988
Viologen Dye Inhibition of Methane Formation by *Methanobacillus omelianskii*. E. A. Wolin, R. S. Wolfe, and M. J. Wolin 993
Isolation and Preliminary Characterization of Bacteriophage $\Phi\mu$-4. Fred Shafia and T. L. Thompson 999
Dissociation in *Pseudomonas aeruginosa*. C. H. Zierdt and P. J. Schmidt 1003
Comparative Effects of 5-Fluorouracil on Strains of *Bacillus megaterium*. J. T. Wachsman, S. Kemp, and L. Hogg 1011
Relation of Pyrogenic and Emetic Properties of Enterobacteriaceal Endotoxin and of Staphylococcal Enterotoxin. William J. Martin and Stanley Marcus 1019
Control of Aspartate Transcarbamylase Activity in Type 5 Adenovirus-Infected Hela Cells. Richard A. Consigli and Harold S. Ginsberg 1027
Activity of Aspartate Transcarbamylase in Uninfected and Type 5 Adenovirus-Infected Hela Cells. Richard A. Consigli and Harold S. Ginsberg 1034
Some Differences in the Action of Penicillin, Bacitracin, and Vancomycin on *Bacillus megaterium*. R. Hancock and P. C. Fitz-James 1044
Tryptophan- and Indole-Excreting Prototrophic Mutant of *Escherichia coli*. P. G. Lim and R. I. Mateles 1051
Interrelationships Among Mycobacteria and Nocardiae. R. E. Manion, S. G. Bradley, H. H. Zinneman, and W. H. Hall 1056
Inhibitory Effect of Heparin on Herpes Simplex Virus. André J. Nahmias and Sidney Kibrick 1060
Analysis of Sequential Stages in Serum Bactericidal Reactions. J. Gabriel Michael and Werner Braun 1067
Base Composition of Deoxyribonucleic Acid of Sulfate-Reducing Bacteria Deduced from Buoyant Density Measurements in Cesium Chloride. Grady F. Saunders, L. Leon Campbell, and John R. Postgate 1073
Thymineless Death in *Bacillus megaterium*. J. T. Wachsman, S. Kemp, and L. Hogg 1079
Glyoxylate Metabolism in Growth and Sporulation of *Bacillus cereus*. Robert E. Megraw and Russell J. Beers 1087
Cross-Resistance Relationships in *Escherichia coli* Between Ultraviolet Radiation and Nitrous Acid. Antonio Zampieri and Joseph Greenberg 1094
Lysosomal Disruption by Bacterial Toxins. Alan W. Bernheimer and Lois L. Schwartz 1100
Heterogeneity of Apparently Complete Poliovirus Particles. Joseph J. Tumilowicz and Klaus Hummeler 1105
Metabolism of Mannitol by *Coccidioides immitis*. George W. Lones and Carl Peacock 1114
Use of Thymineless Death to Enrich for Doubly Auxotrophic Mutants of *Bacillus megaterium*. J. T. Wachsman and L. Hogg 1119
Glucosamine-6-Phosphate Degradation by *Proteus vulgaris* and Isolation of Phosphoglucosaminisomerase. H. Aron, H. H. Yonenaka, and H. I. Nakada 1123
Effects of Temperatures Above the Maximum for Germination on the Endospore of *Bacillus cereus*. Georges Knaysi 1129
Use of 5-Fluorouracil for the Isolation of Auxotrophic Mutants of *Bacillus megaterium*. J. T. Wachsman and L. Hogg 1137
Carbohydrate and Lipid Content of Radiation-Resistant and -Sensitive Strains of *Escherichia coli*. E. E. Woodside and W. Kocholaty 1140
Lysis and Dissolution of Cells and Envelopes of an Extremely Halophilic Bacterium. D. J. Kushner 1147

Purification of *Streptomyces venezuelae* Phage. R. A. Kolstad and S. G. Bradley 1157
Influence of Antibiotic Stability on the Results of In Vitro Testing Procedures. Warren E. Wick 1162
Micro Diffusion Precipitin Tests for Enteroviruses and Influenza B Virus. Gordon K. Middleton, Jr., Henry C. Cramblett, Hugh L. Moffet, Joyce P. Black, and Helen Shulenberger 1171
Assay of T_2 Phage by Plaque Count. Emil F. Werly and Anne Monley 1177
Ultrastructure of *Treponema microdentium* and *Borrelia vincentii*. Howard A. Bladen and Edward G. Hampp 1180
Factors Affecting Growth of *Staphylococcus aureus* L Forms on Semidefined Medium. Robert R. Banville 1192
Selective Medium for Carbohydrate-Utilizing Transductants of *Staphylococcus aureus*. W. H. Murphey and E. D. Rosenblum 1198
Electron Microscopy of *Bacillus megaterium* Undergoing Isolation of Its Nuclear Bodies. Philip Fitz-James 1202
Incorporation of Thymidine and Amino Acids Into Deoxyribonucleic Acid and Acid-Insoluble Cell Structures in Pneumococcal Cultures Synchronized for Competence to Transform. Harriett Ephrussi-Taylor and Barbara A. Freed 1211
Antibiotic Control of Tissue Reactions in Dogs Vaccinated With Viable Cells of *Coccidioides immitis*. Merida W. Castleberry, John L. Converse, and Peter J. Soto, Jr. 1216
Antigen Changes During Spore Formation in *Bacillus cereus*. Ann Baillie and John R. Norris 1221
Proteolytic Activity and General Characteristics of a Marine Bacterium, *Aeromonas proteolytica* Sp. N. Joseph R. Merkel, Eugene D. Traganza, Barid B. Mukherjee, Travis B. Griffin, and J. M. Prescott 1227
Cytoplasmic Antigen Relationships Among the Actinomycetales. J. B. Kwapinski .. 1234

NOTES:

Mouse Salivary Gland Virus Plaque Assay on a Stable Line of Mouse Embryo Cells. A. K. Field and J. Fong 1238
Clonal Line of Porcine Kidney Stable Cells for Assay of Japanese Encephalitis Virus. Y. Kanda Inoue and Masa-Atsu Yamada 1239
Cell Elongation in Strains of *Escherichia coli*. Howard I. Adler and Alice A. Hardigree 1240
Growth Rates of *Streptococcus pyogenes* and Derived L Form at Various Temperatures. Charles Panos and Barry Cohen 1242
Method for Electrolysis of Culture Medium to Increase Growth of the Sulfur-Oxidizing Iron Bacterium *Ferrobacillus sulfooxidans*. Norma A. Kinsel and W. W. Umbreit 1243
Mycoplasma laidlawii Var. *inocuum* Comb. Nov. H. E. Adler and M. Shifrine 1245
Inhibitors of Preferentially Stimulated Deoxyribonucleic Acid Synthesis in Pneumococci. William Firshein and Werner Braun 1245
Metabolism of Mannitol and Induction of Mannitol-1-Phosphate Dehydrogenase in *Lactobacillus plantarum*. Maharani Chakravorty 1246
Salmonella lexington Culture of Complex Antigenic Constitution. Alma C. McWhorter and Alice B. Moran 1248
Polymyxin Agar as an Adjunct in the Isolation of El Tor Vibrios. Calvin J. Powell, Jr., and Richard A. Finkelstein 1249
Absence of Type-Specific M Antigen From Group A Streptococci Grown in a Chemically Defined Medium. M. N. Mickelson and H. D. Slade 1251
Indirect Hemagglutination With the Trachoma Agent and Related Microorganisms. Willie Turner and Francis B. Gordon 1251
Viability of *Pseudomonas aeruginosa*. A. Emmanouilidou-Arseni and I. Koumentakou 1253
Pyocyanin Formation by Some Normally Apyocyanogenic Strains of *Pseudomonas aeruginosa*. Y. Azuma and L. D. Witter 1254
Protocol for Micro Antistreptolysin O Determinations. Earl A. Edwards 1254

Effect of Phage-Controlled Restriction on Genetic Linkage in Bacterial Crosses. James Pittard 1256
Immunofluorescence Techniques in Retrospective Diagnosis of Human Listeriosis. Joseph Z. Biegeleisen, Jr. 1257
Micrococcus cryophilus Is Not Flagellated. Ruth A. McLean 1258
Isolation of a Bacteriophage for *Hydrogenomonas facilis*. Christine Pootjes 1259

No. 6, JUNE 1964

Origin of Palmitic Acid Carbon in Palmitates Formed from Hexadecane-1-C^{14} and Tetradecane-1-C^{14} by *Micrococcus cerificans*. W. R. Finnerty and R. E. Kallio 1261
Factors Which Modify the Effect of Sodium and Potassium on Bacterial Cell Membrane. Dorothy H. Henneman and W. W. Umbreit 1266
Influence of the Physical State of the Bacterial Cell Membrane Upon the Rate of Respiration. Dorothy H. Henneman and W. W. Umbreit 1274
Tyrosinase Inheritance in *Streptomyces scabies*. I. Genetic Recombination. Kenneth F. Gregory and Jay C. C. Huang 1281
Tyrosinase Inheritance in *Streptomyces scabies*. II. Induction of Tyrosinase Deficiency by Acridine Dyes. Kenneth F. Gregory and Jay C. C. Huang 1287
Correlation Between Genetic Transformability and Non-Photoreactivability in *Bacillus subtilis*. Albert Kelner 1295
Variation in Rumen *Butyrivibrio* Strains. S. S. Margherita, R. E. Hungate, and Hannelore Storz 1304
Anaerobic Growth of *Fusarium oxysporum*. H. B. Gunner and M. Alexander 1309
Use of *Arthrobacter terregens* for Bioassay of Mycobactin. Claude V. Reich and John H. Hanks 1317
Serological Analyses of Cellular Slime-Mold Development. I. Changes in Antigenic Activity During Cell Aggregation. D. R. Sonneborn, M. Sussman, and L. Levine 1321
Isologous Interference With Ultraviolet and X-Ray Irradiated Bacteriophage T_2. Stuart B. Levy 1330
Genetic Recombination Between the Resistance Transfer Factor and the Chromosome of *Escherichia coli*. Herbert S. Ginoza and Robert B. Painter 1339
Effect of Mitochondrial Stabilizers on the Immunogenicity of the Particulate Fraction Isolated from *Mycobacterium tuberculosis*. Anne S. Youmans and Guy P. Youmans 1346
Effects of Aspartate on Growth and on the Synthesis of α-Amylase in *Pseudomonas saccharophila*. Jerome M. Eisenstadt and Harold P. Klein 1355
Infection of White Swiss Mice With Airborne *Cryptococcus neoformans*. C. D. Smith, R. Ritter, H. W. Larsh, and M. L. Furcolow 1364
Synthesis of Ribonucleic Acid by X-Irradiated Bacteria. E. W. Frampton 1369
Typing of Group A Streptococci by Immunofluorescence. I. Preparation and Properties of Type 1 Fluorescein-Labeled Antibody. Walter W. Karakawa, Earle K. Borman, and Clarence R. McFarland 1377
Comparison of Cytochromes in Mycobacteria Grown in Vitro and in Vivo. Takashi Kusaka, Ryo Sato, and Ko Shoji 1383
Release of Nitrogenous Substances by Brewer's Yeast. III. Shock Excretion of Amino Acids. M. J. Lewis and H. J. Phaff 1389
Biosynthesis of Mycobacillin, a New Antifungal Peptide. I. Role of Nucleic Acid. Arun B. Banerjee and S. K. Bose 1397
Biosynthesis of Mycobacillin, a New Antifungal Peptide. II. Relation Between Streptomycin Dependence and Biosynthesis. Arun B. Banerjee and S. K. Bose 1402
Effect of Hemin and Oxygen Tension on Growth and Nitrate Reduction by Bacteria. N. J. Jacobs, R. E. Heady, J. M. Jacobs, K. Chan, and R. H. Deibel 1406
Adansonian Analysis and Deoxyribonucleic Acid Base Composition of Some Gram-Negative Bacteria. R. R. Colwell and M. Mandel 1412
Bacillus subtilis Deoxyribonucleic Acid Transfer in PBS2 Transduction. I. Mahler, M. Cahoon, and J. Marmur 1423
Quantitative Studies on Glycolytic Enzymes in *Lactobacillus plantarum*. II. Intra-

cellular Concentrations of Glycolytic Intermediates in Glucose-Metabolizing Washed Cells. Shoji Mizushima and Kakuo Kitahara 1429
Control of Uracil Synthesis by Arginine in *Escherichia coli*. Ruth Ben-Ishai, Michal Lahav, and Ada Zamir 1436
Reversal of Ferric Iron of Serum Inhibition of Respiration and Growth of *Bacillus subtilis*. George H. Bornside, Christopher B. Merritt, and Alice C. Weil 1443
Host-Parasite Relationships Among Group A Streptococci. I. Hyaluronic Acid Production by Virulent and Avirulent Strains. Donald S. Willoughby, Yael Ginzburg, and Dennis W. Watson 1452
Host-Parasite Relationships Among Group A Streptococci. II. Influence of Sex on the Susceptibility of Inbred Mice Toward Streptococcal Infection. Donald S. Willoughby and Dennis W. Watson 1457
Proline Oxidases in *Hansenula subpelliculosa*. Chung-Mei Ling and L. R. Hedrick 1462
Development of L-Type growth in *Neisseria gonorrhoeae* Cultures. Louis Dienes, Bojana M. Bandur, and Sarabelle Madoff 1471
Thin Sections of Dividing *Neisseria gonorrhoeae*. Philip Fitz-James 1477
Fate of the Mesosomes of *Bacillus megaterium* during Protoplasting. Philip Fitz-James. 1483
Fine Structure of *Brucella suis* Spheroplasts. William D. Hines, Bob A. Freeman, and Gary R. Pearson 1492
Incorporation of Bacteriophage Genome by Spores of *Bacillus subtilis*. I. Takahashi .. 1499
Plaque Assay for Psittacosis Virus in Monolayers of Chick Embryo Fibroblasts. F. Piraino and C. Abel 1503
Metabolism of Intracellular Polysaccharide by *Streptococcus mitis* and Its Relation to Inducible Enzyme Formation. R. J. Gibbons 1512
Use of a Bacterial Culture Filtrate as an Aid to the Isolation and Growth of Anaerobic Spirochetes. Paul H. Hardy, Jr., Young C. Lee, and E. Ellen Nell 1521

NOTES:

Sulfonamide Resistance of *Clostridium sporogenes*. Roxanna L. Neikirk and Noel R. Krieg 1526
Succinic Acid Degradation by *Veillonella alcalescens*. A. A. Yousten and E. A. Delwiche 1527
Bound Intracellular Glycolic and D-Lactic Acids in *Mycobacterium ranae*. Audree V. Fowler, Merrill N. Camien, and Max S. Dunn 1528
Role of Lipoic Acid in Pyruvate Transport. Franklin R. Leach, Barbara A. Winter, and Dionne D. Wilson 1529
Phospholipids of *Streptococcus lactis*. Patricia MacLeod and Joseph P. Brown 1531
Experimental Candidiasis in Cortisone-Treated Mice. H. F. Cantrell and A. Widra 1532
Erratum 1533

Index of Authors 1535
Index of Subjects 1540
Index of Date of Issue 1548

AUTHOR INDEX

Aaslestad, H. G., 1296
Adams, E. W., 418
Adams, J. N., 865
Ahn, T. H., 545
Airth, R. L., 1372
Ajl, S. J., 1467
Akagi, J. M., 440, 813
Alami, S. Y., 1810
Albertini, A., 1567
Albro, P. W., 425, 981
Altemeier, W. A., 1811
Anacker, R. L., 1130, 1705
Andrews, A. W., 269, 1394
Antoine, A. D., 1672
Arai, T., 716
Arima, K., 143, 151

Babcock, V. I., 187
Bailey, R., 187
Baillie, A., 264
Bains, H. S., 216
Baker, E. E., 1277
Baldwin, J. N., 1304, 1442
Barkulis, S. S., 1288
Baron, L. S., 395, 1598
Baugh, C. L., 269, 553, 1394
Beck, J. V., 850
Beck, R. W., 586
Beers, R. F., Jr., 1249
Behbehani, A. M., 1608
Benziman, M., 1010, 1678
Beppu, M., 143, 151
Beran, K., 1104
Berk, R. S., 559
Beyerlein, B., 805
Biegeleisen, J. Z., Jr., 260
Birch-Andersen, A., 727, 1428
Bishop, F. S., 37
Bladen, H. A., 763, 1482
Blair, E. B., 96
Bleiweis, A. S., 653, 1198
Blenden, D., 877
Boltralik, J. J., 1288
Boone, J. G., 1814
Boyer, H., 1652
Bragg, P. D., 1006, 1019, 1399
Braithwaite, G. D., 974
Brandriss, M. W., 537
Brede, H. D., 536
Brenneman, C., 1201
Brinkman, S. A., 477
Brock, T. D., 165
Brooks, J. B., 1520
Brosbe, E. A., 233, 1813
Bryant, M. P., 401
Buchanan, B. B., 806
Buller, C. S., 440
Bullock, G. L., 1809, 1814
Bulmash, J. M., 1813
Burchall, J. J., 1038
Burgus, R. C., 538, 581, 1139
Burton, S. D., 1755
Busser, R. J., 591, 630

Callahan, W. S., 805
Calvet, J., 1084
Campbell, W. E., Jr., 802
Cannefax, G. R., 111, 811
Carere, A., 226
Carpenter, C. M., 545
Cary, S. G., 96
Cassani, G., 1567
Catelli, A. R., 1
Cazin, J., Jr., 1624
Centifanto, Y. M., 776
Chang, T.-W., 1790
Cheldelin, V. H., 179
Chichester, C. O., 1688
Christensen, J. A., 1519
Chubb, L. G., 93
Ciferri, O., 1567
Citarella, R. V., 1598
Cohen, G. H., 329, 1695
Cohen, J. O., 1364
Cole, R. J., 532
Colwell, R. R., 831, 1816
Cook, T. M., 620, 1112
Cooper, R. C., 624
Corpe, W. A., 1433
Costilow, R. N., 690, 695
Coty, V. F., 468
Cowan, S. T., 804
Cox, C. D., 1045
Croom, J. A., 389
Curran, H. R., 1338

Dainko, J. L., 449
Darlington, W. A., 803
Davis, B. R., 16
Davis, J. B., 468
Day, L. E., 690, 695
Day, R. A., 297
DeCicco, B. T., 1590
Decker, D. W., 1624
Dedman, M. D., 273
Deibel, R. H., 4, 602, 858, 1078
Deig, E. F., 42
Deitz, W. H., 1112

Delaquerriere-Richardson, L., 87
De Ley, J., 937
Demain, A. L., 339, 991
de Repentigny, J., 444
deVito, P. C., 1341
Digenio, T. A., 1277
Dimmick, R. L., 1380
Dimopoullos, G. T., 81
Dolman, C. E., 216
Domermuth, C. H., 727, 1428
Donaldson, D. M., 1049
Doudoroff, M., 60
Dowell, V. R., Jr., 1805, 1811
Downey, R. J., 904
Downs, C. M., 137
Dreyfuss, J., 1341
Dudman, W. F., 640, 782
Duell, E. A., 1762
Duerre, J. A., 130
Dunbar, C. E., 1809
Durham, N. N., 1525
Durr, I. F., 361

Eagon, R. G., 25
Egeberg, M. C., 473
Egeberg, R. O., 473
Elconin, A. E., 473
Englesberg, E., 946
Erlandson, R. A., 187
Eveland, W. C., 1476
Evenchik, Z., 313
Evenson, A. E., 542
Ewing, W. H., 16

Fagan, P. T., 1078
Faine, S., 1493
Falkow, S., 395, 682, 1598
Ferguson, D., 1525
Ferretti, J. J., 497
Finkelstein, R. A., 1705
Fitzgerald, R. J., 763
Fleming, H. P., 1529
Foerster, G. E., 1372
Foltz, V. D., 1700
Formal, S. B., 1503
Frank, M. E., 1151
Frappier, A., 444
Freeman, B. A., 1310
Freeman, B. M., 93
Fregnan, G. B., 87
Freifelder, D., 987
Freundt, E. A., 727, 1428
Friedlander, H., 491
Friedman, L., 660, 795, 812
Friedman, S., 937
Fukushi, K., 1130
Fulton, M., 1813
Funk, H. B., 1200

Galanter, Y., 1010
Galasso, G. J., 309, 433
Gardner, N. R., 758
Garner, H. R., 1798
Geason, D. J., 1145
Gentry, G. A., 1324
Georg, L. K., 477
Gerhardt, P., 1774
Gerwing, J., 216
Gest, H., 1201
Gibbons, R. J., 1316, 1329
Goldberg, H. S., 877
Goodgal, S. H., 1538
Gordon, M. A., 509
Gorzynski, E. A., 1240
Goss, W. A., 1112
Gottlieb, D., 114
Greer, D. L., 812
Guirard, B. M., 72
Gustafson, L. A., 1595

Haaf, A. S., 896
Hahon, N., 533
Hallum, J. V., 265
Halvorson, H. O., 313
Halvorson, H. Orin, 263, 374
Hamilton, J. G., 1084
Hammond, B. F., 1807
Hancock, R., 633
Hankin, H., 1288
Hanks, J. H., 1672
Hanson, A. W., 111, 811
Haque, R., 1304, 1442
Harada, K., 1257
Harmon, S., 1521
Harold, F. M., 1416
Harper, M. K., 1338
Hashimoto, H., 261
Haskins, W. T., 1705
Hastings, J. W., 313
Hatch, M. T., 566
Heckly, R. J., 1730
Hedgecock, L. W., 1349
Heimlich, E. M., 591
Heller, N., 1678
Helsinki, D. R., 1573
Hendlin, D., 991
Henry, L., 1721
Hertman, I., 1002
Heymann, H., 1288
Hidalgo, R. J., 81
Hill, E. O., 1805, 1811
Hill, E. P., 1556
Hill, R. F., 1283
Hinze, H. C., 1185
Hoag, W. G., 534
Hobbs, H., 1721
Hodson, P. H., 803

Hoffman, H., 1151
Hollis, E., 1814
Holt, J. N., 1163
Housewright, R. D., 220
Howarth, S., 273
Hubersak, C., 200
Huddleson, I. F., 540
Huff, E., 1155
Hufham, J. B., 538, 581, 1139
Hughes, M., 1201
Hunt, D. E., 893
Huston, C. K., 425, 981
Hyatt, M. T., 1403

Inoue, S., 1762
Ishida, S., 646

Jacobs, C. D., 1525
Jenkins, E. M., 418
Jensen, B. M., 1049
Jensen, R. S., 1049
Johnson, E. J., 956
Johnson, E. M., 395
Johnson, R. C., 1618
Johnston, R., 1521
Johnstone, D. B., 329, 1695
Jones, D., 602
Jones, L. M., 1527

Kagan, B. M., 591, 630
Kahn, P., 1573
Kajima, M., 709
Kameda, M., 1257
Kaneshiro, W. M., 532
Kapsimalis, B., 1316
Karakawa, W. W., 1198
Kasatiya, S.-S., 1585
Kasimer, P., 11
Kasuya, M., 322
Kaufman, H. E., 319
Kautter, D., 1521
Kelly, F. C., 1810
Kerravala, Z. J., 374
Kerwar, S. S., 179
Keyman, A., 313
Kietzman, J. N., 233, 1813
King, K. W., 817
Knisely, R. F., 491
Kobayashi, G. S., 660, 795
Koforth, J. F., 795
Kolodziej, B. J., 821
Kominek, L. A., 263
Kondo, E., 1266
Konetzka, W. A., 1580
Kono, K., 261
Kot, E., 497
Kozikowski, E. H., 533
Krause, R. M., 1198
Kritzler, H., 974
Krulwich, T. A., 1200
Kubitschek, H. E., 1595
Kurnick, N. B., 233, 1813
Kuwajima, Y., 809
Kvetkas, M. J., 858
Kwapinski, J. B., 1211

LaBrec, E. H., 1503
Lackman, D. B., 1130
Lamb, J. W., 542
Landman, O. E., 457
Landy, M., 1705
Lanham, J. W., 553
Larsen, D. H., 1380
Larson, A. D., 1015, 1296
Lawson, L. A., 1324
Layne, J. S., 956
Leavitt, R. I., 172
Lee, L. H., 1608
Lee, S. H. S., 885
Leonard, C. G., 220
Levinson, H. S., 1403
Lewis, V. J., 1520
Lieb, M., 1585
Liepnieks, S., 630
Listgarten, M. A., 1087
Liu, P. V., 1421
Loesche, W. J., 200, 1329
LoGerfo, P., 1550
Loper, J. C., 1805
Lord, T. H., 1700
Lundgren, D. G., 1119

Maaløe, O., 987
McCleskey, C. S., 1065, 1071
Macdonald, J. B., 200
McIvor, M., 667, 676
McKinnon, J. M., 1524
Maclean, N., 1459
McNeill, J. J., 389, 1056
Magnani, T. J., 1503
Maisch, W. F., 1388
Maloney, E. D., 319
Mandel, A. D., 1524
Mandel, M., 1816
Marshall, R. G., 267
Martin, G. R., 1169
Mathemeier, P. F., 1661, 1667
Matheson, A., 1049
Mattheis, D. K., 220
Mattheis, M. J., 220
Meier, H., 534
Mergenhagen, S. E., 1169, 1482
Merkel, J. R., 974
Merrick, J. M., 60
Mickelson, M. N., 158
Mickey, M. R., 31

Miller, I. M., 991
Milner, K. C., 1705
Minamishima, Y., 1195
Mitsuhashi, S., 261, 1257, 1266
Molander, C. W., 591
Montie, T. C., 1467
Morello, J. A., 1277
Mori, R., 1195
Morihara, K., 745
Morita, R. Y., 831, 1661, 1667, 1755
Morowitz, H. J., 11
Morris, M.-E., 771
Morrison, N. E., 1672
Mortlock, R. P., 838, 845
Moseley, F. P., 1815
Moskovits, G., 1815
Moyed, H. S., 1024
Mull, J. D., 805

Nakagawara, G., 1636
Nakata, H. M., 1522
Nakayama, T. O. M., 1688
Navalkar, R. G., 255
Neter, E., 1240, 1244
Newton, W. L., 537
Nichida, S., 716
Nicholes, P. S., 566
Nickel, L., 1538
Niederman, R. A., 1038
Niederpruem, D. J., 210, 1497, 1721
Nielsen, M. H., 727, 1428
Nishida, H., 716
Nishida, S., 646, 1636, 1641, 1647
Nishihara, H., 545
Nishihara, M., 1220, 1230
Niven, C. F., Jr., 4, 602
Niwa, M., 809
Njoku-Obi, A. N., 418
Norris, J. R., 264
Novelli, G. D., 99
Nutter, W. E., 1175
Nylen, M. U., 763

Ogata, C., 716, 922
O'Leary, W. M., 1356
Oppenheimer, C. H., 541
Ordal, Z. J., 1529
Ormsbee, R. A., 1205
Orton, W. L., 1743
Oxley, H., 1155

Pallansch, M. J., 1338
Paretsky, D., 137
Parfentjev, I. A., 1
Parks, L. W., 20, 179
Patel, V., 877
Patrick, W. C., III, 802
Pattee, P. A., 574
Peacock, M. G., 1205
Pengra, R. M., 808
Pentz, E. I., 497
Perry, D., 595
Pettijohn, L. L., 1809
Pfiffner, J. J., 538, 581, 1139
Pfister, R. M., 1119
Phaff, H. J., 758
Pickens, E. G., 1130
Pierce, W. A., Jr., 912
Pittard, J., 367
Pittman, K. A., 401
Pizer, L. I., 611
Pokorný, V., 1104
Polan, C. E., 1056
Polglase, W. J., 1006, 1399
Pollard, M., 709
Polsinelli, M., 1567
Potochny, M. L., 611

Rabinowitz, J. C., 806
Ralston, D. J., 667, 676
Ramakrishnan, T., 367
Randall, C. C., 1324
Rao, P. J., 1045
Rapp, F., 1448
Reichmann, M. E., 216
Ribi, E., 1705, 1774
Richardson, M., 1163
Riley, J. M., 802
Robertstad, G. W., 477
Rogers, C. G., 965
Rogers, D., 279
Rogers, P., 1618
Rogers, T. E., 81
Rogosa, M., 37
Romano, A. H., 1145
Romig, W. R., 1220, 1230
Rosan, B., 1807
Rosenblum, E. D., 1737
Roth, I. L., 523
Rotter, J., 1810
Rouf, M. A., 1545
Rumack, B. H., 1310
Ryter, A., 457

Sadhukhan, P., 309
Safferman, R. S., 771
Salmon, C. W., 137
Sarles, W. B., 965
Sato, S., 716, 922
Schaechter, M., 1612
Schindler, C. A., 815
Schlenk, F., 449
Schneider, H., 682, 1503
Schuhardt, V. T., 815
Schwartz, N. M., 996
Scott, L. V., 702
Scott, W. M., 538, 581, 1139
Seligman, S. J., 31

Sguros, P. L., 346
Shafia, F. M., 293, 850
Shah, R., 297
Sharon, N., 709
Sharp, D. G., 309, 433
Shaw, P. D., 1629
Shelton, D. C., 1175
Shipkey, F. H., 187
Shugart, L. R., 586
Shwayri, A. N., 361
Silliker, J. H., 1078
Silver, W. S., 776
Silverman, C. S., 1155
Simms, J., 346
Simpson, K. L., 1688
Slade, H. D., 595
Slepecky, R. A., 821
Smith, D. C., 1700
Smith, D. W., 87, 255
Smith, P. B., 1364
Smith, P. F., 122, 1602
Snell, E. E., 72
Snieszko, S. F., 1809, 1814
Socransky, S. S., 200, 1087, 1316, 1329
Sokolski, W. T., 532
Sonea, S., 444
Sorsoli, W. A., 20
Southam, C. M., 187
Spada-Sermonti, I., 226
Spence, K. D., 20
Spencer, J. F. T., 758
Srinivasan, V. R., 374
Stalheim, O. H. V., 48, 55
Stanley, J. P., 468
Stapert, E. M., 532
Stashak, P. W., 1705
Steel, K. J., 804
Steinman, H. G., 537
Stocks, P. K., 1065, 1071
Storvick, W. O., 817
Streiblová, E., 1104
Strout, J., 534
Sud, I. J., 1612
Surgalla, M. J., 269, 553, 1394
Sussman, A. S., 1556
Suzuki, M., 1257
Suzuki, T., 1240
Svihla, G., 449
Swaney, L. M., 491
Swisher, E. J., 817

Tamai, K., 1641, 1647
Taplin, G. V., 545
Tawara, J., 531
Taylor, M. L., 105
Taylor, N. W., 929
Taylor, W. H., 99, 105
Theodore, T. S., 946
Thompson, T. L., 293
Tourtellotte, M. E., 11
Tove, S. B., 389, 1056
Treick, R. W., 1580
Trent, D. W., 702
Tully, J. G., 381
Tyrone, S., 1737

Umbriet, W. W., 1590
Utter, M. F., 1762

Valdivia, E., 87
VanDemark, P. J., 122, 1602
van der Hoeden, J., 1493
Van Etten, J. L., 114
Vaughn, R. H., 411
Voelz, H., 1196, 1497
von Graevenitz, A., 960

Wachsman, J. T., 1388
Walker, D. L., 1185
Walker, H., 25
Wang, N., 1629
Watanabe, T., 716, 922
Watkins, H. M. S., 42
Weaver, J. R., 574
Weimberg, R., 1743
Weinberger, H. J., 591
Weinstein, L., 1790
Weld, J. T., 1356
Wessman, G. E., 356
Whang, H. Y., 1244
Wiebers, J. L., 1798
Wiegeshaus, E. H., 255
Williams, N. B., 1807
Williams, R. P., 523
Willingham, C. A., 541
Wilson, D. E., 1550
Wilson, J. B., 48, 55
Wittenberger, C. L., 896
Wohlhieter, J. A., 1598
Wolin, M. J., 1038
Wood, W. A., 838, 845
Wright, K., 1524

Yamadeya, Y., 809
Yamagishi, T., 646, 1641
Yip, L. C., 297
Yoch, D. C., 808
York, G. K., 411
Youmans, A. S., 1030
Youmans, G. P., 1030
Young, I. E., 242
Youngner, J. S., 265

Zeleznick, L. D., 1288
Zimmerman, L. N., 653
Zolla, S., 630

SUBJECT INDEX

acetic acid bacteria, deoxyribonucleic acid hybrids of, 937
Acetobacter suboxydans, isoleucine metabolism in, 179
Acetobacter suboxydans, valine metabolism in, 179
Acetobacter xylinum, carbon dioxide exchange in, 1678
Acetobacter xylinum, malic dehydrogenase from, 1010
Acetobacter xylinum, oxaloacetate decarboxylation in, 1678
acetolactate formation in *Escherichia coli*, 172
N-acetyl-D-glucosamine kinase from *Streptococcus pyogenes*, 1288
acid phosphatase of *Saccharomyces mellis*, 1743
acids, *see* acetic, amino, deoxyribonucleic, dipicolinic, lactic, mevalonic, nalidixic, β-nitropropionic, pyruvic, ribonucleic, tricarboxylic
acridine orange binding by *Micrococcus lysodeikticus*, 1249
acriflavine, elimination of *Staphylococcus aureus* penicillin resistance with, 261
Actinomyces species, identification of, 477
Actinomycetales, antigenic structure of, 1211
actinomycin resistance in *Bacillus subtilis*, 1567
activation of bacterial endospores, 313
adaptation of vaccinia virus to growth in L cell cultures, 309
"adenineless" yeasts, nutrition of, 339
adenosine, inhibition of thiamine biosynthesis by, 1027
adenosine triphosphatase, site of activity in bacteria, 1196
adenosine triphosphate sulfurylase in yeast, 1341
Aerobacter aerogenes, enzyme metabolism in, 838, 845
Aerobacter aerogenes, magnesium requirement of, 808
β-alanine-pyruvic aminotransferase, effect on growth of *Flavobacterium*, 1525
algae, blue-green, characteristics of virus from, 771
alginolytic activity of Enterobacteriaceae, 16
Allescheria boydii, nutrition of, 1624
Allescheria boydii, sporulation of, 1624
amino acid protection against irradiation, 893
amino acids, aromatic, use by *Hydrogenomonas facilis*, 1590
amino acids, in ethionine-resistant *Saccharomyces cerevisiae*, 20
amino group formation in *Streptococcus bovis*, 1038
6-aminonicotinamide, effect on vaccinia virus infection, 885
anaerobic dispensing of reduced media, 541
Anaplasma marginale, immunology of, 81
antibiotic-depleted *Escherichia coli*, enzymatic activity of, 1399
antibiotic sensitivity of *Staphylococcus aureus* forms, 630
antibody-producing cells, demonstration by fluorescein-labeled antigen, 1476
antigenic changes in *Staphylococcus aureus*, 444
antigenic structure of Actinomycetales, 1211
antigens of Enterobacteriaceae, destruction of, 1244
antigens of Enterobacteriaceae, separation of, 1240
antigens of *Pasteurella tularensis*, 566
antigens of *Rhizobium meliloti*, 782
apiculate yeasts, multiple scars in, 1104
arsenite resistance, in *Pseudomonas pseudomallei*, 143, 151
Arthrobacter terregens, mycobactin bioassay by, 1672
assay procedure for Colorado tick fever virus, 42
8-azaguanine, differentiation of leptospires with, 1618
6-azauridine, effect on Newcastle disease virus-infected cells, 1550
Azotobacter agilis, capsular polysaccharide of, 1695
Azotobacter cysts, resistant properties of, 956
Azotobacter vinelandii, extracellular polysaccharides of, 329

bacilli, effect of cephalothin on, 1790
Bacillus anthracis, cytopathic area surrounding, 523
Bacillus anthracis, in dried beef, staining of, 260
Bacillus cereus, an abortively disporic variant of 242
Bacillus cereus, control of penicillinase biosynthesis in, 297
Bacillus cereus, nutrients for, 1522
Bacillus cereus, polyribosomes in, 1119
Bacillus cereus, specificities of catalases of, 264
Bacillus cereus spores, exosporium of, 1774
Bacillus cereus sporulation, inhibition of, 263
Bacillus licheniformis, transformation in, 220
Bacillus megaterium, effects of streptomycin on, 633
Bacillus megaterium, growth rate of, 1612
Bacillus megaterium, thymineless induction of bacteriophage in, 1388
Bacillus megaterium, trace metals in sporulation, 821
Bacillus megaterium spores, germination of, 1403
Bacillus spores, electrodialyzed, 1338

Bacillus stearothermophilus, inorganic pyrophosphatase activity of, 1661, 1667
Bacillus subtilis, actinomycin resistance in, 1567
Bacillus subtilis, behavior of mesosomes in, 457
Bacillus subtilis, electron transfer, vitamin K in, 904
Bacillus subtilis, production of guanosine-5'-monophosphate by, 991
Bacillus subtilis bacteriophage SP3, 1220, 1230
Bacillus subtilis spores, response to ionic environment, 1529
bacteria, human indigenous, in germ-free mice, 1316
bacteria, inorganic elements in, 1545
bacterial endospores, activation of, 313
bacterial sporogenesis, endogenous, 374
bacteriophage, irradiated, propagation of, 1283
bacteriophage, thymineless induction in *Bacillus megaterium*, 1388
bacteriophage $\phi\mu$-4, calcium ion requirement of, 293
bacteriophage common to *Escherichia coli* and *Pasteurella pestis*, 1002
bacteriophage P1 *CM*, production of, 1266
bacteriophage SP3 of *Bacillus subtilis*, 1220, 1230
bacteriophage typing of *Staphylococcus aureus*, 1364
bacteriophages, staphylococcal, properties of, 1737
bacteriophages attacking group D streptococci, 165
Bacteroides oralis, isolation from human oral cavity, 1329
Bacteroides ruminicola, nitrogen sources for, 401
Basidiobolus, identification by use of temperature, 812
basidiospores of *Schizophyllum commune*, 210, 1497
beef, dried, staining of *Bacillus anthracis* in, 260
Beggiatoa, growth of, 1755
bicarbonate, effect on *Pasteurella pestis* growth, 269, 553, 1394
biochemical changes during fungal growth, 114
biochemical changes in guinea pigs with *Coxiella burnetii* infection, 137
biochemistry of marine fungi, 346
biohydrogenation of unsaturated fatty acids, 1056
bioluminescence in *Panus stypticus*, 1372
biosynthesis of nitro compounds, 1629
biotin deficiency, effect on fatty acid spectrum, 389
Bordetella pertussis, leakage of cell components from, 809
Borrelia, recovery after lyophilization, 811
Borrelia refringens, isolation of, 111
botulinus type E toxin, purification of, 216
bovine parainfluenza-3 virus, isolation in chick embryos, 267
bovine *Pasteurella*, dissociation of, 356
Brucella, multiplication in cultured cells, 1163
Brucella spheroplasts, effect on monocytes, 1310
Brucella spp., characterization with safranin O, 1527
brucellae, growth enhancement on beef liver agar, 540
Butyribacterium rettgeri, glucose repression in, 896
calcium ion, requirement of bacteriophage $\phi\mu$-4, 293
Candida albicans, pyrogenicity of, 660
Candida albicans, spheroplasts of, 795
carbohydrate metabolism in *Coxiella burnetii*, 1205
carbohydrate nutrition of *Allescheria boydii*, 1624
carbon compounds, effect on *Bacillus megaterium* spores, 1403
carbon dioxide exchange in *Acetobacter xylinum*, 1678
carbon dioxide fixation, *Salmonella* mutant deficient in, 946
carotenoids, yeast, biosynthesis of, 1688
carrier state in *Rickettsiae sennetsu*, 1195
catalase, effect on *Beggiatoa*, 1755
catalase activity in *Leptospira*, 1045
catalase-like enzyme in *Streptococcus faecalis*, 602
catalases of *Bacillus cereus*, specificities of, 264
cationic stabilization of rhinovirus type 1, 1608
cations, in *Bacillus megaterium* sporulation, 821
cell components, leakage from *Bordetella pertussis*, 809
cell envelope contents, effect on growth rate, 1612
cell-wall lysins of *Staphylococcus aureus*, 667
cell walls of Actinomycetales, 1211
cell walls, streptococcal, improved preparation, 1198
cellobiose, respiration by *Cellvibrio gilvus*, 817
cells, enzyme synthesis in, 99
Cellvibrio gilvus, respiration of cellobiose by, 817
cephalothin, effect on gram-negative bacilli, 1790
chloramphenicol resistance, transduction of, 1266
Chromobacterium violaceum, growth of, 1433
chromoproteins of *Porphyra*, proteolytic attack on, 974
chromosomal deletion, effect on chromosome transfer, 367
chromosome transfer, by *Shigella flexneri* Hfr strain, 682
chromosome transfer in *Salmonella* Hfr strains, 395
clinical specimens, transport medium for, 96
Clostridium bifermentans, taxonomy of, 1641, 1647
Clostridium botulinum, sporulation in, 690, 695
Clostridium botulinum type E, isolation of, 1521
Clostridium botulinum type E toxin, purification of, 216
Clostridium nigricans, phosphoroclastic reaction of, 813

Clostridium novyi, toxigenic strains of, 1636
Clostridium perfringens, toxigenic, from soil, 646
Clostridium sordellii, taxonomy of, 1641, 1647
Clostridium sordellii substrains, sporulation of, 1647
Clostridium sordellii substrains, toxigenicity of, 1647
Coccidioides immitis, effect of salinity on, 473
Coccidioides immitis, effect of temperature on, 473
coccidioidomycosis, experimental, in rabbits, 233, 1813
Coleman organism, hydrogenase of, 440
colicinogenic factors in *Escherichia coli*, 1573
colony form of unclassified mycobacteria, relation to mycoside content, 255
Colorado tick fever virus, in cell culture, 702
Colorado tick fever virus, plaque assay for, 42
complement-fixation antigen of *Anaplasma*, fractionation, 81
continuous-culture vessels, growth of bacteria on, 1380
continuous cultures, mutation in, 1595
corrinoids, microbial degradation of, 581, 1139
Coxiella burnetii, assay in chick embryo, 802
Coxiella burnetii, infection in guinea pigs, 137
Coxiella burnetii, metabolic activity in, 1205
Coxiella burnetii, microscopy of, in chick yolk sac, 1130
Cryptococcus neoformans, presence in slime flux of desert plants, 542
Cryptococcus neoformans, pyrogenicity of, 660
cystathionine, use by *Neurospora mutants*, 1798
cystine-dependent mutants of poliovirus, 265
cysts, *Azotobacter*, resistant properties of, 956
cytopathic area surrounding *Bacillus anthracis*, 523

dehydrogenase, activity in *Aerobacter aerogenes*, 845
density-gradient patterns of *Staphylococcus aureus*, 1155
deoxyribonucleic acid base composition of *Sphaerophorus necrophorus*, 1805
deoxyribonucleic acid hybrids of acetic acid bacteria, 937
deoxyribonucleic acid of vibrios, 1816
deoxyribonucleic acid synthesis, inhibition by phenethyl alcohol, 1580
deoxyribonucleic acid virus, replication in thymine-deficient cells, 1324
depolymerization of poly-β-hydroxybutyrate, 60
Dermatophilus strains, characterization of, 509
device for anaerobic dispensing of reduced media, 541
dietary materials, isolation of *Salmonella* from, 534
dihydroorotic dehydrogenase, properties of, 105
dihydrostreptomycin, inhibition of *Escherichia coli* by, 1019
2,4-dinitrophenol, effect on *Thiobacillus ferrooxidans*, 850
dipicolinic acid formation from hydrocarbons, 803
dipicolinic acid synthesis, relation to spore formation, 690
Diplococcus pneumoniae, resistance of mice to, 1349
dissociation of *Pasteurella haemolytica*, 356
drug resistance, episome-mediated transfer in Enterobacteriaceae, 716, 922
drug resistance, in vivo transmission of, 322
drug resistance, of enteric bacteria, 1257, 1266
dysentery, bacillary, pathogenesis of, 1503

ECHO virus 28, growth of, 1608
elastase, production by *Pseudomonas aeruginosa*, 745
electrodialysis, effect on bacterial spores, 1338
electron transfer in *Bacillus subtilis*, vitamin K in, 904
endogenous factor in *Bacillus subtilis*, 374
endophyte of *Psychotria bacteriophila*, 776
endospores, activation of, 313
endotoxic fraction from *Escherichia coli*, 1169
enteric bacteria, transfer of drug resistance among, 322
Enterobacteriaceae, activities of, 16
Enterobacteriaceae, antigens of, 1240, 1244
Enterobacteriaceae, episome-mediated transfer of drug resistance in, 716, 922
enterococci from rat intestines, identification, 965
enzymatic activity in *Pasteurella pestis*, 553
enzyme activity of *Acetobacter xylinum*, 1010
enzyme families in *Aerobacter aerogenes*, 838, 845
enzyme from *Streptococcus pyogenes*, 497
enzyme production by *Pseudomonas aeruginosa*, 745
enzymes, associated with fungal bioluminescence, 1372
enzymes, catalase-like, in *Streptococcus faecalis*, 602
enzymes, in *Thiobacillus thioparus*, 624
enzymes, of *Bacillus cereus*, specificities of, 264
enzymes, of pyrimidine pathway in *Escherichia coli*, 99, 105
enzymes, *see also* adenosine triphosphatase, catalase, dehydrogenase, invertase, isomerase, kinase, lipase, nicotinamide adenine dinucleotidase
episomic elements, transfer to *Proteus*, 1598
erythromycin resistance in *Staphylococcus aureus*, 574
Escherichia coli, acetolactate formation in, 1972
Escherichia coli, action of nalidixic acid on, 1112
Escherichia coli, altering glucose permeability of, 279

Escherichia coli, bacteriophage common to *Pasteurella pestis*, 1002
Escherichia coli, colicinogenic factors in, 1573
Escherichia coli, endotoxic fraction from, 1169
Escherichia coli, energy required for thymineless death, 987
Escherichia coli, enzymes of pyrimidine pathway in, 99, 105
Escherichia coli, F factors in, 1573
Escherichia coli, gene transfer by F′ strains of, 367
Escherichia coli, genetic control in, 1652
Escherichia coli, "germination tube" growth in, 1151
Escherichia coli, incorporation of S^{35} in, 130
Escherichia coli, inhibition by dihydrostreptomycin, 1019
Escherichia coli, inhibition of deoxyribonucleic acid synthesis in, 1580
Escherichia coli, isoleucine metabolism in, 172
Escherichia coli, mutation in continuous cultures, 1595
Escherichia coli, protein changes and permeability, 279
Escherichia coli, serine metabolism in, 611
Escherichia coli, staining with fluorescein-labeled antigen, 1476
Escherichia coli, streptomycin-dependent, enzyme activities of, 1399
Escherichia coli, suppression of *lac* o^c mutation in, 996
Escherichia coli, T_4rII multiplication in, 1585
Escherichia coli, valine formation by, 1006
Escherichia coli, valine metabolism in, 172
Escherichia coli hapten, origin of, 1705
Escherichia coli K-12, drug resistance of, 1257
Escherichia coli mutants, ability to propagate phage T_1, 1283
ethanol, use to separate antigens of Enterobacteriaceae, 1240
ethionine-resistant yeast, amino acids in, 20
Eubacterium, internal structures of, 763
exosporium of *Bacillus cereus* spores, structure of, 1774
exotoxin in *Pseudomonas pseudomallei*, 1730
extracellular guanosine-5′-monophosphate, production by *Bacillus subtilis*, 991
extracellular hemolysis of *Pseudomonas aeruginosa*, 559
extracellular neurotoxin from *Mycoplasma neurolyticum*, 381
extracellular polysaccharides of *Azotobacter vinelandii*, 329

F factor in *Escherichia coli*, 1573
fatty acids, unsaturated, biohydrogenation of, 1056
fatty acids of *Lactobacillus plantarum*, 389
fatty acids of *Sarcina lutea*, 425
feedback sensitivity of photosynthetic bacteria, 1201
fermentation of pyruvate by *Streptococcus faecalis*, 4
ferredoxin of *Methanobacterium omelianski*, 806
fibroma virus infection, response of rabbit cells to, 1185
fish, nocardial infection in, 1809
fish epizootic, *Pasteurella* sp. from, 1814
flagella, attachment in *Vibrio comma*, 531
flavine adenine dinucleotide-linked enzyme from *Acetobacter xylinum*, 1010
Flavobacterium, β-alanine synthesis in, 1525
"floc," use as replica plating material, 1815
fluorescein-labeled antigen, use to demonstrate antibody-producing cells, 1476
fluorescent-antibody reagents, fluorochromes for preparation of, 1520
fluorochromes for preparation of fluorescent-antibody reagents, 1520
fractionation of *Anaplasma* complement-fixation antigen, 81
fumarate reduction by *Streptococcus faecalis*, 858
fungal bioluminescence, enzymes associated with, 1372
fungi, biochemistry of *Penicillium atrovenetum* growth, 114
fungi, marine, biochemistry of, 346

gels, silica, clear preparations for streaking, 1200
gene transfer by *Escherichia coli* F′ strains, 367
genetic control in *Escherichia coli*, 1652
genetic transfer of streptomycin resistance, 960
genetic transformation in streptococci, 595
gentamycin, sensitivity of *Staphylococcus aureus* forms to, 630
germ-free mice, human indigenous bacteria in, 1316
germination of *Bacillus megaterium* spores, 1403
"germination tube" growth in *Escherichia coli*, 1151
glucose fermentation by *Streptococcus faecalis*, 858
glucose permeability of *Escherichia coli*, 279
glucose repression, in *Butyribacterium rettgeri*, 896
glutamate synthesis, in *Streptococcus bovis*, 1038
glycylvaline, uptake by *Leuconostoc mesenteroides*, 1175
gram-negative bacilli, effect of cephalothin on, 1790
growth of *Basidiobolus*, 812
growth of blue-green algal virus, 771
growth of *Rhizobium meliloti*, 640
growth of *Thiobacillus thiooxidans* in shaken culture, 620
growth requirements for *Bacillus licheniformis* transformation, 220

growth response of *Pasteurella pestis* to bicarbonate, 269
growth requirements of *Treponema microdentium*, 200
growth responses of marine fungi, 346
guanosine-5′-monophosphate, production by *Bacillus subtilis*, 991
Guaroa virus, growth in tissue culture, 187

Haemophilus influenzae, linkage relationship of markers in, 1538
Haemophilus parainfluenzae, linkage relationship of markers in, 1538
Haldane's estimate, modification of, 31
Hansenula wingei, protection against ultraviolet irradiation, 893
Hansenula wingei, sexual agglutination in, 929
hapten from *Escherichia coli*, 1705
β-hemolysin, production of, 1304
hemolysins of *Listeria monocytogenes*, purification of, 418
hemolysins of *Staphylococcus aureus*, 1442
hemolysis, extracellular, of *Pseudomonas aeruginosa*, 559
hemolysis of nonhemolytic staphylococci, 1700
Herellea, medium for isolation of, 1524
Hfr strain of *Shigella flexneri*, 682
Hfr strains of *Salmonella*, chromosome transfer in, 395
hydrocarbon content of *Sarcina lutea* lipids, 987
hydrocarbons, formation of dipicolinic acid from, 803
hydrogen sulfide, discrepant tests for, 1813
hydrogen sulfide, production by *Veillonella*, 37
hydrogenase of the Coleman organism, 440
Hydrogenomonas facilis, use of aromatic acids by, 1590
hydroxybutyrate, depolymerization of, 60

immune diffusion analysis of *Rhizobium meliloti* antigens, 782
immunization with defatted tubercle bacilli, 87
immunofluorescence of *Sphaerotilus natans*, 1145
immunofluorescent staining of *Bacillus anthracis*, 260
immunogenic substance from *Mycobacterium tuberculosis*, 1030
immunogenic substances from *Pasteurella tularensis*, 566
immunology of *Anaplasma marginale*, 81
infectious particles, estimation of, 31
infective powers of vaccinia virus, 433
inhibition of microorganisms by sorbic acid, 411
inorganic elements in bacteria, 1545
intestinal enterococci from rats, 965
intracytoplasmic membranous elements in *Eubacterium*, 763
invertase activity in *Neurospora*, 1556
ionic environment, effect on *Bacillus subtilis* spores, 1529
irradiation of *Staphylococcus aureus*, 545
isolation of *Borrelia refringens*, 111
isoleucine metabolism in *Acetobacter suboxydans*, 179
isoleucine metabolism in *Escherichia coli*, 172
isomerase, activity in *Aerobacter aerogenes*, 845

kanamycin, sensitivity of *Staphylococcus aureus* forms to, 630
kinase, activity in *Aerobacter aerogenes*, 845
Klebsiella pneumoniae, resistance of mice to, 1349
Krebs cycle intermediates, effect of *Salmonella gallinarum* on, 93

L cells, infection by vaccinia virus, 433
L cells, interaction of Colorado tick fever virus with, 702
L colony, fate of mesosomes in, 457
L forms, staphylococcal, antibiotic sensitivity of, 630
L phase variants of *Staphylococcus aureus*, 591
lactate-degrading system in *Butyribacterium rettgeri*, 896
lactic acid bacteria, effect of polyamines on growth, 72
lactic dehydrogenase, of *Pseudomonas natriegens*, 25
Lactobacillus casei, capsular reaction of, 1807
Lactobacillus casei, use in determining polyamine content of bacteria, 72
Lactobacillus plantarum, fatty acids of, 389
Lactobacillus plantarum, mevalonic acid metabolism by, 361
lactose-utilizing *Proteus* strains, 1598
leaf-nodule symbiosis, 776
leakage of *Bordetella pertussis* cell components, 809
Leptospira, catalase activity in, 1045
Leptospira, colonial variation, 1493
Leptospira, morphological variation, 1493
Leptospira canicola, nutrition of, 48
leptospiral lipase, characterization of, 877
leptospires, cultivation of, 48, 55
leptospires, differentiation with 8-azaguanine, 1618
leptospires, growth and lysis in synthetic medium, 55
lethality of *Coxiella burnetii* in chick embryos, 802
Leuconostoc mesenteroides, glycylvaline uptake by, 1175
Leuconostoc mesenteroides, valine uptake by, 1175
lincomycin, sensitivity of *Staphylococcus aureus* forms to, 630

lipase, leptospiral, characterization of, 877
lipids of *Sarcina lutea*, 425, 981
lipolytic activity of Enterobacteriaceae, 16
liquid nitrogen freezing in microbial assays, 532
Listeria monocytogenes, hemolysins, purification of, 418
lymphoid cells, fate of brucellae in, 1163
lyophilization, recovery of organisms after, 811
β-lysin, serological relation to plakin, 1049
lysins, cell wall, of *Staphylococcus aureus*, 667
lysis of *Staphylococcus aureus*, 676
lysostaphin, action against *Staphylococcus aureus* infection, 815
lysozyme, action on *Escherichia coli* endotoxin, 1169

M protein components of streptococci, separation, 912
magnesium requirement of *Aerobacter aerogenes*, 808
malic dehydrogenase, from *Acetobacter xylinum*, 1010
mammalian cells, thymine-deficient, 1324
marine fungi, biochemistry of, 346
marine organisms, taxonomy of *Vibrio marinus*, 831
maturation of forespores in *Clostridium botulinum*, 695
McCoy cells, microscopy of psittacosis virus in, 709
measles virus, replication of, 1448
mechanism of arsenite resistance in *Pseudomonas pseudomallei*, 151
mechanism of microbial inhibition by sorbic acid, 411
medium for *Bacillus licheniformis* transformation, 220
medium for *Borrelia refringens*, 111
medium for *Mycoplasma laidlawii*, 11
medium for *Pasteurella pestis*, 491
medium for shipment of clinical specimens, 96
medium for *Streptococcus pyogenes*, 158
mesosomes, behavior during protoplast formation, 457
metabolism in *Coxiella burnetii*, 1205
metabolism in *Staphylococcus aureus*, 545
metabolism of adenosine triphosphate sulfurylase in yeast, 1341
metabolism of cellobiose by *Cellvibrio gilvus*, 817
metabolism of 2-methylalanine, 1296
metabolism of mevalonic acid by lactobacilli, 361
metabolism of serine in *Escherichia coli*, 611
methane-oxidizing bacteria, 1071
methane-oxidizing bacteria, nitrogen fixation by, 468
methane-oxidizing pink-pigmented bacteria, 1065
Methanobacterium omelianski, ferredoxin of, 806
Methanomonas methanooxidans, characterization of, 1071
methionineless *Neurospora* mutants, 1798
2-methylalanine, metabolism of, 1296
S-methylcysteine, use by *Neurospora* mutants, 1798
Metschnikowia kamienskii, sp. n., yeast associated with brine shrimp, 758
mevalonic acid metabolism, by *Lactobacillus plantarum*, 361
microbial degradation of corrinoids, 581, 1139
micrococci, differentiation from staphylococci, 804
Micrococcus lysodeikticus, acridine orange binding by, 1249
Mima, medium for isolation of, 1524
mitochondria from yeast spheroplasts, 1762
morphology of *Methanomonas methanooxidans*, 1071
morphology of *Mycoplasma gallisepticum*, 1428
morphology of oral spirochetes, 1087
murine toxin synthesis in *Pasteurella pestis*, tryptophan analogues of, 1467
mutation in continuous cultures, 1595
mutation in *Escherichia coli*, 996
mutants, *Escherichia coli*, ability to propagate phage T_1, 1283
mutants, of *Bacillus subtilis* bacteriophage SP3, 1220, 1230
mutants, of *Neurospora*, methionineless, 1798
mutants, of *Neurospora crassa*, osmotic production without added enzyme, 1084
mutants, T_4rII of *Escherichia coli*, 1585
mycobacteria, unclassified, colony form and mycoside content, 255
Mycobacterium tuberculosis, defatted vaccines, immunization with, 87
Mycobacterium tuberculosis, immunogenic substance from, 1030
Mycobacterium tuberculosis, resistance-enhancing activity of culture filtrates of, 1349
mycobactin bioassay by *Arthrobacter terregens*, 1672
Mycoplasma, respiratory pathways in, 122
Mycoplasma, ultrastructure of, 727
Mycoplasma gallisepticum, morphology of, 1428
Mycoplasma hominis, tricarboxylic acid cycle in, 1602
Mycoplasma laidlawii, defined medium for, 11
Mycoplasma neurolyticum, exocellular neurotoxin from, 381
mycoside content of unclassified mycobacteria, relation to colony form, 255

nalidixic acid, action on *Escherichia coli*, 1112
neomycin, sensitivity of *Staphylococcus aureus* forms to, 630
Neurospora, mutants, methionineless, 1798

Neurospora, mutants, osmotic production without added enzyme, 1084
Neurospora, trehalase and invertase activity in, 1556
neurotoxin production by *Mycoplasma neurolyticum*, 381
Newcastle disease virus-infected cells, ribonucleic acid synthesis in, 1550
nicotinamide adenine dinucleotidase, from *Streptococcus pyogenes*, 497
nicotine adenine dinucleotide (reduced) oxidation, in *Mycoplasma*, 122
nitrogen, liquid, freezing in microbial assays, 532
nitrogen assimilation by *Aerobacter aerogenes*, 808
nitrogen fixation by methane-oxidizing bacteria, 468
nitrogen sources, in nutrition of *Bacteroides ruminicola*, 401
β-nitropropionic acid, biosynthesis by *Penicillium atrovenetum*, 1629
Nocardia, recombination between two species, 865
nocardial infection in trout, 1809
nutrition of "adenineless" yeasts, 339
nutrition of *Bacteroides ruminicola*, 401
nutrition of brucellae, 540
nutrition of *Leptospira canicola*, 48
nutrition of *Mycoplasma laidlawii*, 11
nutrition of *Pasteurella pestis*, 491
nutrition of *Schizophyllum commune*, 1721
nutrition of *Streptococcus pyogenes*, 158
nutritional factors in serine biosynthesis, 611
nutritional mutations by *Staphylococcus aureus*, 226

oleate-requiring, hemolytic *Pediococcus*, 1078
oral bacteroides, isolation of new species, 1329
oral spirochetes, morphology of, 1087
osmotic production of *Neuropsora* mutant without added enzyme, 1084
oxaloacetate decarboxylation in *Acetobacter xylinum*, 1678
oxidative phosphorylation in *Escherichia coli*, 1019

Panus stypticus, bioluminescence in, 1372
particles, infectious, estimation of, 31
Pasteurella sp. from fish epizootic, 1814
Pasteurella haemolytica, dissociation of, 356
Pasteurella pestis, bacteriophage common to *Escherichia coli*, 1002
Pasteurella pestis, effect of bicarbonate on, 269, 553, 1394
Pasteurella pestis, murine toxin synthesis in, 1467
Pasteurella pestis, selective medium for, 491
Pasteurella tularensis, protective antigens from, 566
pathogenicity of bacillary dysentery, 1503
pectolytic activity of Enterobacteriaceae, 16
Pediococcus, oleate-requiring, hemolytic, 1078
penicillin, lethality in germ-free guinea pigs, 537
penicillin resistance of *Staphylococcus aureus*, elimination of, 261
penicillinase biosynthesis in *Bacillus cereus*, control of, 297
Penicillium, formation of dipicolinic acid from hydrocarbons by, 803
Penicillium atrovenetum, biochemical changes during growth of, 114
Penicillium atrovenetum, biosynthesis of β-nitropropionic acid, 1629
pentitols, metabolism in *Aerobacter aerogenes*, 838, 845
pentoses, metabolism in *Aerobacter aerogenes*, 838, 845
peptides, in nutrition of *Bacteroides ruminicola*, 401
permeability of *Escherichia coli*, 279
phage, *see* bacteriophage
phenethyl alcohol, in media for anaerobic bacteria, 1811
phenethyl alcohol, inhibition of deoxyribonucleic acid synthesis by, 1580
phosphate, effect on *Thiobacillus ferrooxidans*, 850
phosphoroclastic reaction of *Clostridium nigricans*, 813
photosynthetic bacteria, feedback sensitivity of, 1201
physiological saline, tolerance of *Staphylococcus aureus* to, 1
physiology of *Methanomonas methanooxidans*, 1071
physiology of sporulation in *Clostridium botulinum*, 695
pigmentation variant of *Pseudomonas aeruginosa*, 273
pigments from vitamin B_{12}, 1139
pink-pigmented methane-oxidizing bacteria, 1065
plakin, serological relation to β-lysin, 1049
plaque assay procedure, for Colorado tick fever virus, 42
plaque differentiation of measles virus, 1448
plaque formation by psittacosis virus, 533
plaque production by rhinovirus type 1, 1608
pleuropneumonia-like organisms, medium for *Mycoplasma*, 11
poliovirus, cystine-dependent thermoresistant mutants of, 265
poly-β-hydroxybutyrate, depolymerization of, 60
polyamines, effect on growth of lactic acid bacteria, 72
polymyxin B, sensitivity of *Staphylococcus aureus* forms to, 630
polyribosomes, in *Bacillus cereus*, 1119
polysaccharide, capsular, of *Azotobacter agilis*, 1695
polysaccharide formation by *Chromobacterium violaceum*, 1433

polysaccharide production by *Rhizobium meliloti* 640
polysaccharides of *Azotobacter vinelandii*, 329
Porphyra, chromoproteins, proteolytic attack on, 974
protein components of *Streptococcus pyogenes*, separation, 912
proteinase, of *Streptococcus faecalis* var. *liquefaciens*, 586, 653
proteinase, production by *Pseudomonas aeruginosa*, 745
proteolytic attack on *Porphyra* chromoproteins, 974
Proteus, *lac*$^+$ strains from clinical specimens, 1598
protoplast formation, behavior of mesosomes during, 457
protoplasts, *Streptococcus faecalis*, stabilization of, 1416
Pseudomonas aeruginosa, destruction of enterobacterial antigens by, 1244
Pseudomonas aeruginosa, enzyme production by, 745
Pseudomonas aeruginosa, extracellular hemolysin of, 559
Pseudomonas aeruginosa, pigmentation variants of, 273
Pseudomonas aeruginosa, slime, toxicity of, 805
Pseudomonas aeruginosa, toxigenicity of, 1421
Pseudomonas natriegens, lactic dehydrogenase of, 25
Pseudomonas pseudomallei, arsenite resistance in, 143, 151
Pseudomonas pseudomallei, filtrates, biologically active substances in, 1730
Pseudomonas rubescens, reduction of vitamin B_{12} by, 538
Pseudomonas rubescens, vitamin B_{12} pigments derived by, 1139
psittacosis virus, electron microscopy of, 709
psittacosis virus, plaque formation by, 533
Psychotria bacteriophila, endophyte of, 776
puromycin, effect on Newcastle disease virus-infected cells, 1550
pyrimethanine, effect on *Toxoplasma gondii*, 319
pyrimidine pathway in *Escherichia coli*, enzymes of, 99, 105
pyrimidines, substitution for bicarbonate in *Pasteurella pestis* cultures, 1394
pyrogenicity of yeast cells, 660
pyrophosphatase activity of *Bacillus stearothermophilus*, 1661, 1667
pyruvate, fermentation by *Streptococcus faecalis*, 4
pyruvic acid metabolism, effect of *Salmonella gallinarum* on, 93

R factor, six-drug resistant, 922
R factor, transduction with phage P1, 1266
R factors, naturally occurring, 716
rabbits, experimental coccidioidomycosis in, 233, 1813
radiation, amino acid protection against, 893
rats, enterococci from, 965
recombination between nocardiae, 865
replica plating, materials for, 1815
replication of measles virus, 1448
resistance enhancement by culture filtrates of *Mycobacterium tuberculosis*, 1349
resistance of *Azotobacter* cysts, 956
respiration of cellobiose by *Cellvibrio gilvus*, 817
respiration of *Schizophyllum commune* basidiospores, 210
respiratory pathways in *Mycoplasma*, 122
rhinovirus type 1, growth of, 1608
Rhizobium meliloti, antigens of, 782
Rhizobium meliloti, growth in defined medium, 640
Rhodopseudomonas capsulata, feedback sensitivity of, 1201
Rhodospirillum rubrum, feedback sensitivity of, 1201
Rhodotorula glutinis carotenoids, biosynthesis of, 1688
ribonucleic acid synthesis in Newcastle disease virus-infected cells, 1550
ribosomal proteins of *Escherichia coli*, 130
Rickettsia sennetsu, persistent infection by, 1195
rickettsiae, microscopy of, in chick yolk sac, 1130
rumen bacteria, fatty acid biohydrogenation by, 1056

S^{35}, incorporation in *Escherichia coli*, 130
Saccharomyces, "adenineless," nutrition of, 339
Saccharomyces cerevisiae, ethionine-resistant, amino acids in, 20
Saccharomyces cerevisiae, pyrogenicity of, 660
Saccharomyces cerevisiae vacuole, role during sporulation, 449
Saccharomyces kluyveri, sexual agglutination in, 929
Saccharomyces wellis, acid phosphatase of, 1743
safranin O, for characterization of brucellae, 1527
salinity, effect on *Coccidioides immitis*, 473
Salmonella, chromosome transfer in, 395
Salmonella, isolation from dietary materials, 534
Salmonella, isolation from laboratory mice, 534
Salmonella chersina, a new serotype, 536
Salmonella gallinarum, effect on Krebs cycle intermediates in fowl, 93
Salmonella newington, drug resistance of, 1257
Salmonella typhimurium, mutant deficient in CO_2 fixation, 946
salmonellosis in mice, diagnosis of, 1277
saprophytic source of *Cryptococcus neoformans*, 542
Sarcina lutea, fatty acids of, 425
Sarcina lutea, lipids of, 425, 981

Sarcina lutea, preservation for antibiotic assays, 532
scars, in apiculate yeasts, 1104
Schizophyllum commune, basidiospores, respiration of, 210
Schizophyllum commune, fine structure of basidiospores, 1497
Schizophyllum commune, nutrition of, 1721
Schizosaccharomyces pombe, "adenineless," nutrition of, 339
Schizosaccharomyces pombe, structure of, 1459
D-serine inhibition of growth of *Flavobacterium*, 1525
serine metabolism in *Escherichia coli*, 611
serological test for diagnosis of salmonellosis, 1277
serological typing of *Staphylococcus aureus*, 1364
serology of *Anaplasma marginale*, 81
serology of β-lysin, 1049
Serratia marcescens, continuous culture of, 1380
sexual agglutination of yeasts, 929
sheath synthesis in *Sphaerotilus natans*, 1145
Shigella flexneri, Hfr strain of, 682
Shigella flexneri, in bacillary dysentery, 1503
Shope fibroma virus, response to infection with, 1185
Shope papilloma virus, assay for, 1519
silica gels, clear preparations for streaking, 1200
slime flux of desert plants, *Cryptococcus neoformans* in, 542
slime of *Pseudomonas aeruginosa*, toxicity of, 805
sodium chloride, tolerance of *Staphylococcus aureus* to, 1
soil, toxigenic *Clostridium novyi* from, 1636
soil, toxigenic *Clostridium perfringens* from, 646
soil bacterium, metabolism of 2-methylalanine by, 1296
soil saprophytes, effect of environment on, 473
sorbic acid, inhibition of microorganisms by, 411
spectrochemical analysis of inorganic elements in bacteria, 1545
spermine, stabilization of *Streptococcus faecalis* protoplasts by, 1416
Sphaerophorus necrophorus, transition from bacilli to large bodies, 1805
Sphaerotilus natans, sheath synthesis in, 1145
spheroplasts, *Brucella*, cytopathogenic effect of, 1310
spheroplasts, enzyme synthesis in, 99
spheroplasts, of *Candida albicans*, 795
spheroplasts, of yeast, mitochondria from, 1762
spirochetes, oral, morphology of, 1087
spores, *Bacillus cereus*, exosporium of, 1774
spores, *Bacillus megaterium*, germination of, 1403
spores, *Bacillus subtilis*, response to ionic environment, 1529
spores, bacterial, electrodialyzed, 1338
sporulation, role of yeast vacuole during, 449
sporulation in *Bacillus subtilis*, 374
sporulation in *Clostridium botulinum*, 690, 695
sporulation of *Bacillus cereus*, inhibition of, 263
sporulation of *Bacillus megaterium*, trace metals in, 821
staphylococcal beta-hemolysin, production of, 1304
staphylococcal phages, properties of, 1737
staphylococci, differentiation from micrococci, 804
staphylococci, nonhemolytic, hemolysis of, 1700
Staphylococcus aureus, antigenic changes in, 444
Staphylococcus aureus, cell-wall lysins of, 667
Staphylococcus aureus, density-gradient patterns of, 1155
Staphylococcus aureus, effect of freezing and thawing on, 545
Staphylococcus aureus, effect of irradiation on, 545
Staphylococcus aureus, effect of lyophilization on, 545
Staphylococcus aureus, elimination of penicillin resistance of, 261
Staphylococcus aureus, erythromycin resistance in, 574
Staphylococcus aureus, hemolysins of, 1442
Staphylococcus aureus, L-phase variants of, 591
Staphylococcus aureus, lysis of, 676
Staphylococcus aureus, lysostaphin therapy against, 815
Staphylococcus aureus, nutritional mutations by, 226
Staphylococcus aureus, serological typing of, 1364
Staphylococcus aureus, tolerance to sodium chloride, 1
Staphylococcus aureus, transduction in, 226
Staphylococcus aureus forms, sensitivity to antibiotics, 630
staphylococcus-fibrogen reactions, 1810
streptococcal cell walls, improved preparations, 1198
streptococci, group D, bacteriophages of, 165
streptococci, transformation in, 595
Streptococcus bovis, amino group formation in, 1038
Streptococcus bovis, glutamate synthesis in, 1038
Streptococcus faecalis, catalase-like enzyme in, 602
Streptococcus faecalis, fumerate reduction by, 858
Streptococcus faecalis, protoplasts, stabilization of, 1416
Streptococcus faecalis, pyruvate fermentation by, 4
Streptococcus faecalis var. *liquefaciens*, proteinase of, 586, 653
Streptococcus pyogenes, *N*-acetyl-D-glucosamine kinase from, 1288
Streptococcus pyrogenes, enzyme from, 497
Streptococcus pyogenes, M protein components, separation, 912
Streptococcus pyogenes, nutrition of, 158

streptomycin, effects on *Bacillus megaterium*, 633
streptomycin-dependent *Escherichia coli*, enzyme activities of, 1399
streptomycin-dependent *Escherichia coli*, valine formation by, 1006
streptomycin resistance, genetic transfer of, 960
structure of *Mycoplasma gallisepticum*, 1428
sugars, effect on *Bacillus megaterium* spores, 1403
suppression of *lac* o^c mutation in *Escherichia coli*, 996
symbiosis, leaf-nodule, 776
synthetic medium, growth of leptospirae in, 55

T_4rII multiplication in *Escherichia coli*, 1585
taxonomy of acetic acid bacteria, 937
taxonomy of Enterobacteriaceae, 16
taxonomy of *Vibrio marinus*, 831
temperature, effect on *Coccidiodes immitis*, 473
temperature-sensitive mutants of *Bacillus subtilis* bacteriophage SP3, 1220, 1230
tetrazolium reduction in *Escherichia coli*, 1019
thermoresistant mutants in poliovirus, 265
thiamine biosynthesis, inhibition by adenosine, 1027
Thiobacillus ferrooxidans, effect of 2,4-dinitrophenol on, 850
Thiobacillus ferrooxidans, effect of phosphate on, 850
Thiobacillus thiooxidans, growth in shaken culture, 620
Thiobacillus thioparus, tricarboxylic acid cycle enzymes in, 624
thymine-deficient cells, virus replication in, 1324
thymineless death in *Escherichia coli*, energy requirement, 987
thymineless induction of bacteriophage in *Bacillus megaterium*, 1388
tissue culture, effect of spheroplasts on monocytes in, 1310
toxicity of *Pseudomonas aeruginosa* slime, 805
toxigenic strains of *Clostridium novyi*, 1636
toxigenicity, relation to sporulating ability, 646
toxigenicity of clostridia, 1641
toxigenicity of *Pseudomonas aeruginosa*, 1421
toxin, botulinus type E, purification of, 216
Toxoplasma gondii, effect of pyrimethanine on, 319
Toxoplasma gondii, effect of temperature on, 319
trace metal requirements for sporulation, 821
transduction in *Escherichia coli*, 960
transduction in *Staphylococcus aureus*, 226, 960
transfer of drug resistance, 1257
transfer of drug resistance in Enterobacteriaceae, 716, 922
transformation, interspecific, effect on linkage relationships of markers in *Haemophilus*, 1538
transformation in streptococci, 595
transmission of drug resistance in vivo, 322
transport medium for clinical specimens, 96
trehalase activity in *Neurospora*, 1556
Treponema, recovery after lyophilization, 811
Treponema microdentium, growth requirements, 200
tricarboxylic acid cycle enzymes in *Thiobacillus thioparus*, 624
tricarboxylic acid cycle in *Mycoplasma hominis*, 1602
tryptophan analogues of murine toxin synthesis in *pasteurella pestis*, 1467
tubercle bacilli, defatted, immunization with, 87

ultrastructure of *Mycoplasma*, 727
ultrastructure of *Veillonella*, 1482
ultrastructure of yeast scars, 1104
ultraviolet irradiation, amino acid protection against, 893
urease activity of clostridia, 1641

vaccinia virus, changes during adaptation to growth in L cell cultures, 309
vaccinia virus, interfering power of particles of, 433
vaccinia virus infections, 6-aminonicotinamide in, 885
vacuole of *Saccharomyces cerevisiae*, role during sporulation, 449
valine, formation by *Escherichia coli*, 1006
valine, formation in streptomycin-dependent *Escherichia coli*, 1399
valine, uptake by *Leuconostoc mesenteroides*, 1175
valine metabolism in *Acetobacter suboxydans*, 179
valine metabolism in *Escherichia coli*, 172
variant of *Bacillus cereus*, 242
Veillonella, hydrogen sulfide production in, 37
Veillonella, ultrastructure of, 1482
Vibrio comma, flagella attachment in, 531
Vibrio extorquens, identification of, 1065
Vibrio marinus, taxonomy of, 831
vibrios, deoxyribonucleic acid of, 1816
viruses, blue-green algal virus, 771
viruses, bovine parainfluenza-3, isolation in chick embryos, 267
viruses, Colorado tick fever, 42, 702
viruses, deoxyribonucleic acid, replication in thymine-deficient cells, 1324
viruses, growth in tissue culture, 187
viruses, measles, replication of, 1448
viruses, poliovirus, 265
viruses, psittacosis, 533, 709
viruses, Shope fibroma, response to infection with, 1185
viruses, Shope papilloma, assay for, 1519
viruses, vaccinia, 309, 433, 885
viruses, West Nile, 187
vitamin B_{12}, microbial degradation of, 581

vitamin B_{12}, pigments derived by *Pseudomonas rubescens*, 1139
vitamin B_{12}, reduction by *Pseudomonas rubescens*, 538
vitamin deficiency, effect on fatty acids in lactobacilli, 389
vitamin K, in *Bacillus subtilis* electron transfer, 904

West Nile virus, growth in tissue culture, 187
wood-rotting mushroom, *Schizophyllum commune*, structure of, 1497

yeast carotenoids, biosynthesis of, 1688
yeast cells, pyrogenicity of, 660
yeast scars in apiculate yeasts, 1014
yeast spheroplasts, mitochondria from, 1762
yeast vacuole, role during sporulation, 449
yeasts, "adenineless," nutrition of, 339
yeasts, adenosine triphosphate sulfurylase in, 1341
yeasts, ethionine-resistant, amino acids in, 20
yeasts, *Metschnikowia kamienskii*, 758
yeasts, *Schizosaccharomyces pombe*, structure of, 1459
yeasts, sexual agglutination in, 929

INDEX TO DATE OF ISSUE

Month	Date of Issue	Pages
July	7/17/64	1–268
August	8/26/64	269–544
September	9/14/64	545–816
October	10/20/64	817–1204
November	11/19/64	1205–1528
December	12/18/64	1529–1834

JOURNAL

OF

BACTERIOLOGY

VOLUME 88

BALTIMORE, MD.
1964

EDITORIAL BOARD

William B. Sarles, *Editor-in-Chief*.....University of Wisconsin, Madison, Wis.
Edward A. Adelberg, *Editor*.....Yale University, New Haven, Conn.
L. Joe Berry, *Editor*.....Bryn Mawr College, Bryn Mawr, Pa.
L. Leon Campbell, Jr., *Editor*.....University of Illinois, Urbana, Ill.
Harold S. Ginsberg, *Editor*.....University of Pennsylvania School of Medicine, Philadelphia, Pa.

Robert Austrian (1969).....Hospital of the University of Pennsylvania, Philadelphia, Pa.
S. S. Barkulis (1969).....CIBA Pharmaceutical Products, Inc., Summit, N.J.
L. S. Baron (1969).....Walter Reed Army Institute of Research, Washington, D.C.
Alan W. Bernheimer (1969).....New York University, New York, N.Y.
S. Gaylen Bradley (1969).....University of Minnesota, Minneapolis, Minn.
Allan Campbell (1969).....University of Rochester, Rochester, N.Y.
George B. Chapman (1964).....Georgetown University, Washington, D.C.
Robert C. Cleverdon (1967).....University of Connecticut, Storrs, Conn.
C. D. Cox (1966).....University of Massachusetts, Amherst, Mass.
William J. Cromartie (1969)...University of North Carolina School of Medicine, Chapel Hill, N.C.
A. L. Demain (1969).....Merck & Co., Inc., Rahway, N.J.
John A. DeMoss (1969).....University of California, San Diego, La Jolla, Calif.
R. D. DeMoss (1964).....University of Illinois, Urbana, Ill.
Michael Doudoroff (1969).....University of California, Berkeley, Calif.
C. W. Emmons (1966).....National Institutes of Health, Bethesda, Md.
John F. Enders (1969).....Harvard University School of Medicine, Boston, Mass.
Ellis Englesberg (1969).....University of Pittsburgh, Pittsburgh, Pa.
Frank B. Engley, Jr. (1969).....University of Missouri, Columbia, Mo.
E. Edward Evans (1966).....University of Alabama Medical Center, Birmingham, Ala.
A. E. Feller (1965).....University of Virginia School of Medicine, Charlottesville, Va.
William W. Ferguson (1968).....Michigan Department of Health, Lansing, Mich.
Ruth E. Gordon (1966).....Rutgers, The State University, New Brunswick, N.J.
Angus Graham (1969).....Wistar Institute, Philadelphia, Pa.
Maurice Green (1969).....St. Louis University School of Medicine, St. Louis, Mo.
Leonard Hayflick (1969).....Wistar Institute, Philadelphia, Pa.
Werner Henle (1969).....Children's Hospital, Philadelphia, Pa.
James G. Hirsch (1969).....The Rockefeller Institute, New York, N.Y.
John Holland (1969).....University of Washington School of Medicine, Seattle, Wash.
Paul Howard-Flanders (1969).....Yale University School of Medicine, New Haven, Conn.
Jerard Hurwitz (1969).....Albert Einstein Medical School, New York, N.Y.
Arthur G. Johnson (1969).....The University of Michigan School of Medicine, Ann Arbor, Mich.
Elliot Juni (1967).....Emory University, Atlanta, Ga.
R. E. Kallio (1969).....State University of Iowa, Iowa City, Iowa
Lloyd Kozloff (1969).....University of Colorado School of Medicine, Denver, Colo.
J. O. Lampen (1965).....Rutgers, The State University, New Brunswick, N.J.
Einar Leifson (1966).....Loyola University School of Medicine, Chicago, Ill.
H. S. Levinson (1969).....U.S. Army, Natick Laboratories, Natick, Mass.
H. C. Lichstein (1965).....University of Cincinnati College of Medicine, Cincinnati, Ohio
A. G. Marr (1969).....University of California, Davis, Calif.
Elizabeth McCoy (1969).....University of Wisconsin, Madison, Wis.
Joseph Melnick (1969).....Baylor University College of Medicine, Houston, Tex.
Evelyn L. Oginsky (1969).....University of Oregon Medical School, Portland, Ore.
James T. Park (1969).....Tufts University, Boston, Mass.
Robert C. Parlett (1969).....George Washington University, Washington, D.C.
Michael J. Pelczar, Jr. (1969).....University of Maryland, College Park, Md.
H. J. Phaff (1964).....University of California, Davis, Calif.
A. F. Rasmussen (1964).....University of California School of Medicine, Los Angeles, Calif.
Roy Repaske (1969).....National Institutes of Health, Bethesda, Md.
C. F. Robinow (1966).....University of Western Ontario, London, Ontario, Canada
W. R. Romig (1969).....University of California, Los Angeles, Calif.
Harry M. Rose (1964).....Columbia University College of Physicians and Surgeons, New York, N.Y.
Russell W. Schaedler (1969).....The Rockefeller Institute, New York, N.Y.
Louis DS. Smith (1968).....Montana State College, Bozeman, Mont.
Curtis B. Thorne (1966).....MB Division, Fort Detrick, Frederick, Md.
Lewis W. Wannamaker (1969).....University of Minnesota, Minneapolis, Minn.
J. B. Wilson (1969).....University of Wisconsin, Madison, Wis.
Charles Yanofsky (1964).....Stanford University, Stanford, Calif.

Robert A. Day, *Managing Editor*, 115 Huron View Boulevard, Ann Arbor, Mich.

EX OFFICIO

Orville Wyss, *President* (1964–1965).....University of Texas, Austin, Tex.
R. D. Housewright, *Vice-President* (1964–1965).....Fort Detrick, Frederick, Md.
Philipp Gerhardt, *Secretary*.....The University of Michigan, Ann Arbor, Mich.
H. B. Woodruff, *Treasurer*.....Merck & Co., Inc., Rahway, N.J.

Copyright © 1964, American Society for Microbiology

CONTENTS

No. 1, JULY 1964

Tolerance of *Staphylococcus aureus* to Sodium Chloride. I. A. Parfentjev and Anna R. Catelli 1
Pyruvate Fermentation by *Streptococcus faecalis*. R. H. Deibel and C. F. Niven, Jr. 4
Defined Medium for *Mycoplasma laidlawii*. Mark E. Tourtellotte, Harold J. Morowitz, and Phil Kasimer 11
Lipolytic, Pectolytic, and Alginolytic Activities of Enterobacteriaceae. B. R. Davis and W. H. Ewing 16
Amino Acid Accumulation in Ethionine-Resistant *Saccharomyces cerevisiae*. W. A. Sorsoli, K. D. Spence, and L. W. Parks 20
Lactic Dehydrogenases of *Pseudomonas natriegens*. Hazel Walker and R. G. Eagon 25
Estimation of the Number of Infectious Bacterial or Viral Particles by the Dilution Method. Stephen J. Seligman and M. Ray Mickey 31
The Genus *Veillonella*. III. Hydrogen Sulfide Production by Growing Cultures. Morrison Rogosa and Ferial S. Bishop 37
Plaque Assay Procedure for Colorado Tick Fever Virus. E. Frank Deig and H. M. S. Watkins 42
Cultivation of Leptospirae. I. Nutrition of *Leptospira canicola*. O. H. V. Stalheim and J. B. Wilson 48
Cultivation of Leptospirae. II. Growth and Lysis in Synthetic Medium. O. H. V. Stalheim and J. B. Wilson 55
Depolymerization of Poly-β-Hydroxybutyrate by an Intracellular Enzyme System. J. M. Merrick and M. Doudoroff 60
Effect of Polyamine Structure on Growth Stimulation and Spermine and Spermidine Content of Lactic Acid Bacteria. Beverly M. Guirard and Esmond E. Snell 72
Immunology and Serology of *Anaplasma marginale*. I. Fractionation of the Complement-Fixing Antigen. Thomas E. Rogers, Richard J. Hidalgo, and George T. Dimopoullos 81
Induction of Acquired Resistance in Guinea Pigs with Defatted *Mycobacterium tuberculosis* Vaccines. D. W. Smith, G. B. Fregnan, L. DeLaquerriere-Richardson, and E. Valdivia 87
Effect of *Salmonella gallinarum* on Certain Krebs Cycle Intermediates of Domestic Fowl. B. M. Freeman and L. G. Chubb 93
New Transport Medium for Shipment of Clinical Specimens. I. Fecal Specimens. Sylvia G. Cary and Eugene B. Blair 96
Enzymes of the Pyrimidine Pathway in *Escherichia coli*. I. Synthesis by Cells and Spheroplasts. W. Herman Taylor and G. David Novelli 99
Enzymes of the Pyrimidine Pathway in *Escherichia coli*. II. Intracellular Localization and Properties of Dihydroorotic Dehydrogenase. W. Herman Taylor and Mary L. Taylor 105
Isolation of *Borrelia refringens* in Pure Culture From Patients with Condylomata Acuminata. Albert W. Hanson and George R. Cannefax 111
Biochemical Changes During the Growth of Fungi. I. Nitrogen Compounds and Carbohydrate Changes in *Penicillium atrovenetum*. David Gottlieb and James L. Van Etten 114
Respiratory Pathways in the *Mycoplasma*. II. Pathway of Electron Transport During Oxidation of Reduced Nicotinamide Adenine Dinucleotide by *Mycoplasma hominis*. P. J. VanDemark and P. F. Smith 122
Incorporation of S^{35} into Ribosomal Proteins of *Escherichia coli*. John A. Duerre 130
Some Biochemical Changes in the Guinea Pig During Infection with *Coxiella burnetii*. D. Paretsky, C. M. Downs, and C. W. Salmon 137
Induction and Mechanisms of Arsenite Resistance in *Pseudomonas pseudomallei*. Kei Arima and Michiko Beppu 143

Decreased Permeability as the Mechanism of Arsenite Resistance in *Pseudomonas pseudomallei*. Michiko Beppu and Kei Arima 151
Chemically Defined Medium for Growth of *Streptococcus pyogenes*. M. N. Mickelson 158
Host Range of Certain Virulent and Temperate Bacteriophages Attacking Group D Streptococci. Thomas D. Brock 165
Isoleucine and Valine Metabolism in *Escherichia coli*. XII. Characterization of a Factor Involved in Acetolactate Formation. Richard I. Leavitt 172
Valine-Isoleucine Metabolism in *Acetobacter suboxydans* and the Inhibition of Growth by Valine. Suresh S. Kerwar, Vernon H. Cheldelin, and L. W. Parks 179
Virus Biographies. I. Growth of West Nile and Guaroa Viruses in Tissue Culture. Chester M. Southam, Frederick H. Shipkey, Virginia I. Babcock, Roller Bailey, and Robert A. Erlandson 187
Dependency of *Treponema microdentium* on Other Oral Organisms for Isobutyrate, Polyamines, and a Controlled Oxidation-Reduction Potential. S. S. Socransky, W. J. Loesche, C. Hubersak, and J. B. Macdonald 200
Respiration of Basidiospores of *Schizophyllum commune*. Donald J. Niederpruem ... 210
Purification and Molecular Weight Determination of *Clostridium botulinum* Type E Toxin. Julia Gerwing, Claude E. Dolman, M. E. Reichmann, and Hardial S. Bains 216
Transformation to Prototrophy and Polyglutamic Acid Synthesis in *Bacillus licheniformis*. C. Gomez Leonard, D. K. Mattheis, M. J. Mattheis, and R. D. Housewright 220
Nutritional Mutations and Transduction by Ultraviolet-Inactivated Phage in *Staphylococcus aureus*. A. Carere and Isabella Spada-Sermonti 226
Complement-Fixation Titers in Experimental Coccidioidomycosis in Rabbits. Edwin A. Brosbe, Jewell N. Kietzman, and Nathaniel B. Kurnick 233
Characteristics of an Abortively Disporic Variant of *Bacillus cereus*. I. Elizabeth Young 242
Relationship of Mycoside Content and Colony Morphology for Group II and Group III Unclassified Mycobacteria. R. G. Navalkar, E. H. Wiegeshaus, and D. W. Smith 255

NOTES:

Immunofluorescent Staining of *Bacillus anthracis* in Dried Beef. Joseph Z. Biegeleisen, Jr. 260
Elimination of Penicillin Resistance of *Staphylococcus aureus* by Treatment with Acriflavine. Hajime Hashimoto, Kei Kono, and Susumu Mitsuhashi 261
Mode of Inhibition of Sporulation of *Bacillus cereus* by Ethyl Malonate and Ethyl Succinate. Leo A. Kominek and H. Orin Halvorson 263
Immunological Specificities of Spore and Vegetative Cell Catalases of *Bacillus cereus*. John R. Norris and Ann Baillie 264
Cystine-Independent Thermoresistant Mutants of Poliovirus. J. S. Youngner and J. V. Hallum 265
Isolation of Bovine Parainfluenza-3 Virus in Chick Embryos. Ronald G. Marshall 267

No. 2, August 1964

Effects of Bicarbonate on Growth of *Pasteurella pestis*. I. Differential Response of Virulent and Avirulent Cells. M. J. Surgalla, A. W. Andrews, and C. L. Baugh 269
Pigmentation Variants of *Pseudomonas aeruginosa*. S. Howarth and M. D. Dedman 273
Solubilization of Protein Accompanying Loss of Permeability of *Escherichia coli*. Dexter Rogers 279
Calcium Ion Requirement for Proliferation of Bacteriophage $\phi\mu$-4. Fred Shafia and T. L. Thompson 293
Metabolic Control of Penicillinase Biosynthesis in *Bacillus cereus*. Lily C. Yip, Ramesh Shah, and Richard A. Day 297
Quality Changes in Vaccinia Virus During Adaptation to Growth in Cultures of Earle's L Cells. D. G. Sharp, P. Sadhukhan, and G. J. Galasso 309

Activation of Bacterial Endospores. A. Keynan, Z. Evenchik, H. O. Halvorson, and J. W. Hastings 313
Muitiplication and Therapy of *Toxoplasma gondii* in Tissue Culture. Emily D. Maloney and Herbert E. Kaufman 319
Transfer of Drug Resistance Between Enteric Bacteria Induced in the Mouse Intestine. Morimasa Kasuya 322
Extracellular Polysaccharides of *Azotobacter vinelandii*. Gary H. Cohen and Donald B. Johnstone 329
Nutrition of "Adenineless" Auxotrophs of Yeasts. Arnold L. Demain 339
Role of Marine Fungi in the Biochemistry of the Oceans. IV. Growth Responses to Seawater Inorganic Macroconstituents. Peter L. Sguros and Jacqueline Simms 346
Interrelationships of Smooth and Nonsmooth Variants in the Dissociation of *Pasteurella haemolytica*. G. E. Wessman 356
Metabolism of Mevalonic Acid by *Lactobacillus plantarum*. I. F. Durr and A. N. Shwayri 361
Gene Transfer by F′ Strains of *Escherichia coli*. IV. Effect of a Chromosomal Deletion on Chromosome Transfer. James Pittard and T. Ramakrishnan 367
Endogenous Factor in Sporogenesis in Bacteria. II. Growth and Sporulation in *Bacillus subtilis*. Zarrine J. Kerravala, V. R. Srinivasan, and H. Orin Halvorson 374
Production and Biological Characteristics of an Extracellular Neurotoxin From *Mycoplasma neurolyticum*. Joseph G. Tully 381
Biotin Deficiency and the Fatty Acids of Certain Biotin-Requiring Bacteria. Jo A. Croom, J. J. McNeill, and S. B. Tove 389
Chromosome Transfer Kinetics of *Salmonella* Hfr Strains. E. M. Johnson, Stanley Falkow, and L. S. Baron 395
Peptides and Other Nitrogen Sources for Growth of *Bacteroides ruminicola*. K. A. Pittman and M. P. Bryant 401
Mechanisms in the Inhibition of Microorganisms by Sorbic Acid. George K. York and Reese H. Vaughn 411
Purification of the Soluble Hemolysins of *Listeria monocytogenes*. E. M. Jenkins, A. N. Njoku-Obi, and E. W. Adams 418
Lipids of *Sarcina lutea*. I. Fatty Acid Composition of the Extractable Lipids. Charles K. Huston and Phillip W. Albro 425
Relative Plaque-Forming, Cell-Infecting, and Interfering Qualities of Vaccinia Virus. G. J. Galasso and D. G. Sharp 433
Hydrogenase of Coleman's Sulfate-Reducing Bacterium. C. S. Buller and J. M. Akagi 440
Differentiation by Immunodiffusion and by Quantitative Immunofluorescence Between 5-Fluorouracil-Treated and Normal Cells From a Toxinogenic *Staphylococcus aureus* Strain. J. de Repentigny, S. Sonea, and A. Frappier 444
Ultraviolet Microscopy of the Vacuole of *Saccharomyces cerevisiae* During Sporulation. G. Svihla, J. L. Dainko, and F. Schlenk 449
Electron Microscope Study of the Relationship Between Mesosome Loss and the Stable L State (or Protoplast State) in *Bacillus subtilis*. Antoinette Ryter and Otto E. Landman 457
Atmospheric Nitrogen Fixation by Methane-Oxidizing Bacteria. J. B. Davis, V. F. Coty, and J. P. Stanley 468
Effect of Salinity and Temperature on *Coccidioides immitis* and Three Antagonistic Soil Saprophytes. Roger O. Egeberg, Ann E. Elconin, and Margaret C. Egeberg 473
Identification of Species of *Actinomyces*. Lucille K. Georg, Gordon W. Robertstad, and Sherry A. Brinkman 477
Selective Media for the Isolation of *Pasteurella pestis*. Ralph F. Knisely, Lois M. Swaney, and Harold Friedlander 491
Some Characteristics of Streptococcal Nicotinamide Adenine Dinucleotidase and Streptolysin O. E. Irene Pentz, Eva Kot, and J. J. Ferretti 497
The Genus *Dermatophilus*. Morris A. Gordon 509
Nature of the Cytopathic Area Surrounding Virulent Cells of *Bacillus anthracis* in Mouse Spleen. Ivan L. Roth and Robert P. Williams 523

NOTES:

Manner of Attachment of Flagella in *Vibrio comma*. Jutaro Tawara 531
Liquid Nitrogen Freezing in Microbiological Assay Systems. II. Preservation of *Sarcina lutea* for Antibiotic Assays. E. M. Stapert, W. T. Sokolski, W. M. Kaneshiro, and R. J. Cole 532
Plaque Formation by Psittacosis Virus. Edmund H. Kozikowski and Nicholas Hahon 533
Isolation of *Salmonella* spp. From Laboratory Mice and from Diet Supplements. Warren G. Hoag, Judith Strout, and Hans Meier 534
Salmonella chersina 47:z:z_4, a New Serotype. H. D. Brede 536
Absence of Lethal Effect of Penicillin in Germ-Free Guinea Pigs. Walter L. Newton, Harry G. Steinman, and Michael W. Brandriss 537
Reduction of Vitamin B_{12} by *Pseudomonas rubescens*. J. B. Hufham, R. C. Burgus, W. M. Scott, and J. J. Pfiffner 538
Enhancement of Colonial Growth of Brucellae on Beef Liver Agar. I. Forest Huddleson 540
Modified Device for Anaerobic Dispensing of Reduced Media. Charles A. Willingham and Carl H. Oppenheimer 541
Slime Flux of Mesquite as a New Saprophytic Source of *Cryptococcus neoformans*. Adelaide E. Evenson and John W. Lamb 542
Erratum 543

No. 3, SEPTEMBER 1964

Viability and Metabolism of *Staphylococcus aureus* after Freezing, Lyophilization, and Irradiation. T. H. Ahn, H. Nishihara, Charles M Carpenter, and G. V. Taplin 545
Effects of Bicarbonate on Growth of *Pasteurella pestis*. II. Carbon Dioxide Fixation into Oxalacetate by Cell-Free Extracts. C. L. Baugh, J. W. Lanham, and M. J. Surgalla 553
Partial Purification of the Extracellular Hemolysin of *Pseudomonas aeruginosa*. Richard S. Berk 559
Immunogenic Substances in Culture Filtrates and Lysates of *Pasteurella tularensis*. Melvin T. Hatch and Paul S. Nicholes 566
Inducible Resistance to Erythromycin in *Staphylococcus aureus*. Judith R. Weaver and P. A. Pattee 574
Microbial Degradation of Corrinoids. I. Vitamin B_{12}. W. M. Scott, R. C. Burgus, J. B. Hufham, and J. J. Pfiffner 581
Purification and Activity of Proteinase of *Streptococcus faecalis* var. *liquefaciens*. Lee R. Shugart and Raymond W. Beck 586
Induction by Antibiotics and Comparative Sensitivity of L-Phase Variants of *Staphylococcus aureus*. C. W. Molander, B. M. Kagan, H. J. Weinberger, E. M. Heimlich, and R. J. Busser 591
Intraspecific and Interspecific Transformation in Streptococci. Dennis Perry and Hutton D. Slade 595
Catalase Activity of Two *Streptococcus faecalis* Strains and Its Enhancement by Aerobiosis and Added Cations. Dorothy Jones, R. H. Deibel, and C. F. Niven, Jr. 602
Nutritional and Regulatory Aspects of Serine Metabolism in *Escherichia coli*. Lewis I. Pizer and Mary L. Potochny 611
Growth of *Thiobacillus thiooxidans* in Shaken Culture. Thomas M. Cook 620
Evidence for the Presence of Certain Tricarboxylic Acid Cycle Enzymes in *Thiobacillus thioparus*. Robert C. Cooper 624
Sensitivity of Coccal and L Forms of *Staphylococcus aureus* to Five Antibiotics. B. M. Kagan, Susan Zolla, R. Busser, and Silvija Liepnieks 630
Early Effects of Streptomycin on *Bacillus megaterium*. R. Hancock 633
Growth and Extracellular Polysaccharide Production by *Rhizobium meliloti* in Defined Medium. W. F. Dudman 640
Isolation of Toxigenic Strains of *Clostridium perfringens* From Soil. Takayoshi Yamagishi, Shoichi Ishida, and Shoki Nishida 646

Properties of Proteinase From *Streptococcus faecalis* var. *liquefaciens*. Arnold S. Bleiweis and Leonard N. Zimmerman.... 653
Characterization of the Pyrogenicity of *Candida albicans*, *Saccharomyces cerevisiae*, and *Cryptococcus neoformans*. George S. Kobayashi and Lorraine Friedman.... 660
Cell-Wall Lysins of *Staphylococcus aureus* Strains Induced by Specific Typing Phages. Doris J. Ralston and Mary McIvor.... 667
Lysis-From-Without of *Staphylococcus aureus* Strains by Combinations of Specific Phages and Phage-Induced Lytic Enzymes. Doris J. Ralston and Mary McIvor.... 676
Characterization of an Hfr Strain of *Shigella flexneri*. Herman Schneider and Stanley Falkow.... 682
Physiology of the Sporulation Process in *Clostridium botulinum*. I. Correlation of Morphological Changes With Catabolic Activities, Synthesis of Dipicolinic Acid, and Development of Heat Resistance. Lawrence E. Day, and Ralph N. Costilow.... 690
Physiology of the Sporulation Process in *Clostridium botulinum*. II. Maturation of Forespores. Lawrence E. Day and Ralph N. Costilow.... 695
Colorado Tick Fever Virus in Cell Culture. I. Cell-Type Susceptibility and Interaction With L Cells. Dennis W. Trent and L. Vernon Scott.... 702
Electron Microscopy of Latent Psittacosis Virus in McCoy Cells. Masahiro Kajima, Nehama Sharon, and Morris Pollard.... 709
Episome-Mediated Transfer of Drug Resistance in Enterobacteriaceae. VII. Two Types of Naturally Occurring R Factors. Tsutomu Watanabe, Hiroshi Nishida, Chizuko Ogata, Toshihiko Arai, and Sachiko Sato.... 716
Ultrastructure of *Mycoplasma* Species. C. H. Domermuth, M. H. Nielsen, E. A. Freundt, and A. Birch-Andersen.... 727
Production of Elastase and Proteinase by *Pseudomonas aeruginosa*. Kazuyuki Morihara.... 745
Metschnikowia kamienskii, sp. n., a Yeast Associated with Brine Shrimp. J. F. T. Spencer, H. J. Phaff, and N. R. Gardner.... 758
Internal Structures of a *Eubacterium* sp. Demonstrated by the Negative Staining Technique. Howard A. Bladen, Marie U. Nylen, and Robert J. Fitzgerald.... 763
Growth Characteristics of the Blue-Green Algal Virus LPP-1. Robert S. Safferman and Mary-Ellen Morris.... 771
Leaf-Nodule Symbiosis. I. Endophyte of *Psychotria bacteriophila*. Ysolina M. Centifanto and Warren S. Silver.... 776
Immune Diffusion Analysis of the Extracellular Soluble Antigens of Two Strains of *Rhizobium meliloti*. W. F. Dudman.... 782
Some Cytological and Pathogenic Properties of Spheroplasts of *Candida albicans*. George S. Kobayashi, Lorraine Friedman, and Judith F. Kofroth.... 795

NOTES:

Improved Assay Technique for *Coxiella burnetii* in Chick Embryo. Jean M. Riley, William E. Campbell, Jr., and William C. Patrick III.... 802
Dipicolinic Acid Formation from Hydrocarbons by a *Penicillium*. P. H. Hodson and W. A. Darlington.... 803
Comparison of Differentiating Criteria for Staphylococci and Micrococci. S. T. Cowan and K. J. Steel.... 804
Toxicity of *Pseudomonas aeruginosa* Slime. Walter S. Callahan, Barbara Beyerlein, and John D. Mull.... 805
Some Properties of *Methanobacterium omelianskii* Ferredoxin. Bob B. Buchanan and Jesse C. Rabinowitz.... 806
Magnesium Requirement of *Aerobacter aerogenes* for Assimilation of Molecular and Combined Nitrogen. D. C. Yoch and R. M. Pengra.... 808
Leakage of Cell Components of *Bordetella pertussis*. M. Niwa, Y. Yamadeya, and Y. Kuwajima.... 809
Recovery of *Treponema* and *Borrelia* after Lyophilization. Albert W. Hanson and George R. Cannefax.... 811
Effect of Temperature on Growth as a Differentiating Characteristic Between

Human and Nonhuman Isolates of *Basidiobolus* Species. Donald L. Greer and Lorraine Friedman 812
Phosphoroclastic Reaction of *Clostridium nigrificans*. J. M. Akagi 813
Lysostaphin Therapy in Mice Infected with *Staphylococcus aureus*. V. T. Schuhardt and C. A. Schindler 815

No. 4, October 1964

Metabolic Nonequivalence of the Two Glucose Moieties of Cellobiose in *Cellvibrio gilvus*. Elizabeth J. Swisher, Waldemar O. Storvick, and Kendall W. King 817
Trace Metal Requirements for Sporulation of *Bacillus megaterium*. Bruno J. Kolodziej and Ralph A. Slepecky 821
Reisolation and Emendation of Description of *Vibrio marinus* (Russell) Ford. Rita R. Colwell and Richard Y. Morita 831
Metabolism of Pentoses and Pentitols by *Aerobacter aerogenes*. I. Demonstration of Pentose Isomerase, Pentulokinase, and Pentitol Dehydrogenase Enzyme Families. R. P. Mortlock and W. A. Wood 838
Metabolism of Pentoses and Pentitols by *Aerobacter aerogenes*. II. Mechanism of Acquisition of Kinase, Isomerase, and Dehydrogenase Activity. R. P. Mortlock and W. A. Wood 845
Effect of Phosphate Ion and 2,4-Dinitrophenol on the Activity of Intact Cells of *Thiobacillus ferrooxidans*. Jay V. Beck and Fred M. Shafia 850
Fumarate Reduction and Its Role in the Diversion of Glucose Fermentation by *Streptococcus faecalis*. R. H. Deibel and Marilyn J. Kvetkas 858
Recombination Between *Nocardia erythropolis* and *Nocardia canicruria*. James N. Adams 865
Characterization of Leptospiral Lipase. Virendra Patel, Herbert S. Goldberg, and Donald Blenden 877
Effect of 6-Aminonicotinamide on Chick-Embryo Tissue Cultures Infected with Vaccinia Virus. Spencer H. S. Lee 885
Amino Acids as Protective Compounds in Ultraviolet-Irradiated *Hansenula wingei*. D. E. Hunt 893
Lactate-Degrading System in *Butyribacterium rettgeri* Subject to Glucose Repression. Charles L. Wittenberger and Ann S. Haaf 896
Vitamin K-Mediated Electron Transfer in *Bacillus subtilis*. R. J. Downey 904
Electrophoretic Separation of Constituents of Partially Purified M Protein of *Streptococcus pyogenes*. William A. Pierce, Jr. 912
Episome-Mediated Transfer of Drug Resistance in Enterobacteriaceae. VIII. Six-Drug-Resistance R Factor. Tsutomu Watanabe, Chizuko Ogata, and Sachiko Sato 922
Inactivation of Sexual Agglutination in *Hansenula wingei* and *Saccharomyces kluyveri* by Disulfide-Cleaving Agents. Neil W. Taylor 929
Deoxyribonucleic Acid Hybrids of Acetic Acid Bacteria. J. De Ley and S. Friedman 937
Mutant of *Salmonella typhimurium* Deficient in the Carbon Dioxide-Fixing Enzyme Phosphoenolpyruvic Carboxylase. Theodore S. Theodore and Ellis Englesberg 946
Resistant Properties of *Azotobacter* Cysts Induced in Response to Mineral Deficiencies. Joseph S. Layne and Emmett J. Johnson 956
Genetic Transfer of Streptomycin and Aminopropanolstreptomycin Resistance. Alexander von Graevenitz 960
Isolation and Identification of Enterococci from the Intestinal Tract of the Rat. C. G. Rogers and W. B. Sarles 965
Proteolytic Attack of the Chromoproteins of *Porphyra* by Marine Bacterial Enzymes. Joseph R. Merkel, Gordon D. Braithwaite, and Henry Kritzler 974
Lipids of *Sarcina lutea*. II. Hydrocarbon Content of the Lipid Extracts. Phillip W. Albro and Charles K. Huston 981
Energy Requirement for Thymineless Death in Cells of *Escherichia coli*. David Freifelder and Ole Maaløe 987
Production of Extracellular Guanosine-5′-Monophosphate by *Bacillus subtilis*. A. L. Demain, I. M. Miller, and D. Hendlin 991

Suppression of a *lac o°* Mutation in *Escherichia coli*. Norman M. Schwartz 996
Bacteriophage Common to *Pasteurella pestis* and *Escherichia coli*. I. Hertman..... 1002
Formation of Valine by Streptomycin-Dependent *Escherichia coli*. P. D. Bragg and W. J. Polglase 1006
Flavine Adenine Dinucleotide-Linked Malic Dehydrogenase from *Acetobacter xylinum*. Moshe Benziman and Y. Galanter..... 1010
Dihydrostreptomycin, Vitamin K_2-Coupled Tetrazolium Reduction, and Oxidative Phosphorylation in *Escherichia coli*. P. D. Bragg..... 1019
Inhibition of the Biosynthesis of the Pyrimidine Portion of Thiamine by Adenosine. H. S. Moyed..... 1024
Nature of the Labile Immunogenic Substance in the Particulate Fraction Isolated From *Mycobacterium tuberculosis*. Anne S. Youmans and Guy P. Youmans..... 1030
Amino Group Formation and Glutamate Synthesis in *Streptococcus bovis*. J. J. Burchall, R. A. Niederman, and M. J. Wolin..... 1038
Catalase Activity in *Leptospira*. P. J. Rao, A. D. Larson, and C. D. Cox..... 1045
Serological Relationships Among β-Lysin, Plakin, and Leukin. D. M. Donaldson, R. S. Jensen, B. M. Jensen, and A. Matheson..... 1049
Biohydrogenation of Unsaturated Fatty Acids by Rumen Bacteria. C. E. Polan, J. J. McNeill, and S. B. Tove..... 1056
Identity of the Pink-Pigmented Methanol-Oxidizing Bacteria as *Vibrio extorquens*. Peter K. Stocks and C. S. McCleskey..... 1065
Morphology and Physiology of *Methanomonas methanooxidans*. Peter K. Stocks and C. S. McCleskey..... 1071
Some Characteristics of an Oleate-Requiring Hemolytic *Pediococcus*. R. H. Deibel, J. H. Silliker, and P. T. Fagan..... 1078
Production of Protoplasts in an Osmotic Mutant of *Neurospora crassa* without Added Enzyme. James G. Hamilton and Janet Calvet..... 1084
Electron Microscopy of Axial Fibrils, Outer Envelope, and Cell Division of Certain Oral Spirochetes. M. A. Listgarten and S. S. Socransky..... 1087
Multiple Scars, a New Type of Yeast Scar in Apiculate Yeasts. Eva Streiblová, K. Beran, and V. Pokorný..... 1104
Mechanism of Action of Nalidixic Acid on *Escherichia coli*. William A. Goss, William H. Deitz, and Thomas M. Cook..... 1112
Electron Microscopy of Polyribosomes within *Bacillus cereus*. R. M. Pfister and D. G. Lundgren..... 1119
Electron Microscopic Observations of the Development of *Coxiella burnetii* in the Chick Yolk Sac. R. L. Anacker, K. Fukushi, E. G. Pickens, and D. B. Lackman..... 1130
Microbial Degradation of Corrinoids. III. Pigments Derived from Vitamin B_{12} by *Pseudomonas rubescens*. R. C. Burgus, J. B. Hufham, W. M. Scott, and J. J. Pfiffner..... 1139
Pattern of Sheath Synthesis in *Sphaerotilus natans*. Antonio H. Romano and Dorothy J. Geason..... 1145
"Germination Tube" Growth in *Escherichia coli* Microcultures. Heiner Hoffman and Michael E. Frank..... 1151
Density-Gradient Patterns of *Staphylococcus aureus* Cells and Cell Walls During Growth and Mechanical Disruption. Eskin Huff, Harriet Oxley, and Carol S. Silverman..... 1155
Multiplication of *Brucella* in Cultured Lymphoid and Nonlymphoid Cells. Marvis Richardson and Jane N. Holt..... 1163
Properties of a Lysozyme-Dissociated Endotoxic Fraction from *Escherichia coli*. Stephan E. Mergenhagen and George R. Martin..... 1169
Uptake of Valine and Glycylvaline by *Leuconostoc mesenteroides*. Damon C. Shelton and William E. Nutter..... 1175
Response of Cultured Rabbit Cells to Infection with the Shope Fibroma Virus. I. Proliferation and Morphological Alteration of the Infected Cells. Harry C. Hinze and Duard L. Walker..... 1185

NOTES:

Persistent Infection of FL Cells by *Rickettsia sennetsu* (s. *todai*). Yoichi Minamishima and Ryoichi Mori 1195
Sites of Adenosine Triphosphatase Activity in Bacteria. Herbert Voelz 1196
Improved Technique for the Preparation of Streptococcal Cell Walls. Arnold S. Bleiweis, Walter W. Karakawa, and Richard M. Krause 1198
Preparation of Clear Silica Gels That Can Be Streaked. Helen B. Funk and Terry A. Krulwich 1200
Feedback Sensitivity of Threonine Deaminases in Two Species of Photosynthetic Bacteria. Maysie Hughes, Catherine Brenneman, and Howard Gest 1201
Erratum 1203

No. 5, November 1964

Metabolic Activity in *Coxiella burnetii*. Richard A. Ormsbee and Marius G. Peacock 1205
Antigenic Structure of the Actinomycetales. VII. Chemical and Serological Similarities of Cell Walls from 100 Actinomycetales Strains. J. B. Kwapinski 1211
Temperature-Sensitive Mutants of *Bacillus subtilis* Bacteriophage SP3. I. Isolation and Characterization. Mutsuko Nishihara and W. R. Romig 1220
Temperature-Sensitive Mutants of *Bacillus subtilis* Bacteriophage SP3. II. In Vivo Complementation Studies. Mutsuko Nishihara and W. R. Romig 1230
Separation by Ethanol of Common and Somatic Antigens of Enterobacteriaceae. T. Suzuki, E. A. Gorzynski, and E. Neter 1240
Selective Destruction by *Pseudomonas aeruginosa* of Common Antigen of Enterobacteriaceae. H. Y. Whang and E. Neter 1244
Acridine Orange Binding by *Micrococcus lysodeikticus*. Roland F. Beers, Jr. 1249
Drug Resistance of Enteric Bacteria. III. Acquisition of Transferability of Nontransmissible R(TC) Factor in Cooperation with F Factor and Formation of FR(TC). Kenji Harada, Mitsuo Kameda, Mitsue Suzuki, and Susumu Mitsuhashi 1257
Drug Resistance of Enteric Bacteria. IV. Active Transducing Bacteriophage P1 *CM* Produced by the Combination of R Factor with Bacteriophage P1. Eiko Kondo and Susumu Mitsuhashi 1266
Evaluation of Serological and Cultural Methods for the Diagnosis of Chronic Salmonellosis in Mice. Josephine A. Morello, Teresa A. Digenio, and Edgar E. Baker 1277
Relationship Between Ultraviolet Sensitivity and Ability to Propagate Ultraviolet-Irradiated Bacteriophage. Ruth F. Hill 1283
Purification and Properties of *N*-Acetyl-D-Glucosamine Kinase from *Streptococcus pyogenes*. L. D. Zeleznick, H. Hankin, J. J. Boltralik, H. Heymann, and S. S. Barkulis 1288
Bacterial Metabolism of 2-Methylalanine. H. G. Aaslestad and A. D. Larson 1296
Purification and Properties of Staphylococcal Beta-Hemolysin. I. Production of Beta-Hemolysin. Riaz-ul Haque and Jack N. Baldwin 1304
Cytopathogenic Effect of *Brucella* Spheroplasts on Monocytes in Tissue Culture. Bob A. Freeman and Barry H. Rumack 1310
Establishment of Human Indigenous Bacteria in Germ-Free Mice. R. J. Gibbons, S. S. Socransky, and B. Kapsimalis 1316
Replication of a Deoxyribonucleic Acid Virus in Thymine-Deficient Mammalian Cells. Glenn A. Gentry, Lucy A. Lawson, and Charles C. Randall 1324
Bacteroides oralis, Proposed New Species Isolated from the Oral Cavity of Man. W. J. Loesche, S. S. Socransky, and R. J. Gibbons 1329
Properties of Electrodialyzed Bacterial Spores. M. K. Harper, H. R. Curran, and M. J. Pallansch 1338
Metabolic Regulation of Adenosine Triphosphate Sulfurylase in Yeast. Peter C. de Vito and Jacques Dreyfuss 1341
Resistance-Enhancing Activity of Culture Filtrates of *Mycobacterium tuberculosis*. Loyd W. Hedgecock 1349
Lipolytic Activities of *Staphylococcus aureus*. I. Nature of the Enzyme Producing Free Fatty Acids from Plasma Lipids. William M. O'Leary and Julia T. Weld 1356

Serological Typing of *Staphylococcus aureus*. II. Typing by Slide Agglutination and Comparison with Phage Typing. Jay O. Cohen and P. B. Smith..... 1364
Enzymes Associated with Bioluminescence in *Panus stypticus luminescens* and *Panus stypticus non-luminescens*. R. L. Airth and G. Elizabeth Foerster..... 1372
Attachment and Growth of Bacteria on Surfaces of Continuous-Culture Vessels. Don H. Larsen and R. L. Dimmick..... 1380
Thymineless Induction of Bacteriophage in *Bacillus megaterium*. W. F. Maisch and J. T. Wachsman..... 1388
Effects of Bicarbonate on Growth of *Pasteurella pestis*. III. Replacement of Bicarbonate by Pyrimidines. C. L. Baugh, A. W. Andrews, and M. J. Surgalla..... 1394
Enzymatic Activities of Streptomycin-Dependent *Escherichia coli* in Relation to Valine Formation. P. D. Bragg and W. J. Polglase..... 1399
Effect of Sugars and Other Carbon Compounds on Germination and Postgerminative Development of *Bacillus megaterium* Spores. Mildred T. Hyatt and Hillel S. Levinson..... 1403
Stabilization of *Streptococcus faecalis* Protoplasts by Spermine. F. M. Harold..... 1416
Factors That Influence Toxigenicity of *Pseudomonas aeruginosa*. Pinghui V. Liu..... 1421
Gross Morphology and Ultrastructure of *Mycoplasma gallisepticum*. C. H. Domermuth, M. Nielsen, E. A. Freundt, and A. Birch-Andersen..... 1428
Factors Influencing Growth and Polysaccharide Formation by Strains of *Chromobacterium violaceum*. William A. Corpe..... 1433
Types of Hemolysins Produced by *Staphylococcus aureus*, As Determined by the Replica Plating Technique. Riaz-ul Haque and Jack N. Baldwin..... 1442
Plaque Differentiation and Replication of Virulent and Attenuated Strains of Measles Virus. Fred Rapp..... 1448
Electron Microscopy of a Fission Yeast, *Schizosaccharomyces pombe*. Norman Maclean. 1459
Selective Inhibition by Tryptophan Analogues of Murine Toxin Synthesis in *Pasteurella pestis*. Thomas C. Montie and Samuel J. Ajl..... 1467
Use of a Fluorescein-Labeled Sonically Disrupted Bacterial Antigen to Demonstrate Antibody-Producing Cells. Warren C. Eveland..... 1476
Ultrastructure of *Veillonella* and Morphological Correlation of an Outer Membrane with Particles Associated with Endotoxic Activity. Howard A. Bladen and Stephan E. Mergenhagen..... 1482
Virulence-Linked Colonial and Morphological Variation in *Leptospira*. S. Faine and J. van der Hoeden..... 1493
Fine Structure of Basidiospores of *Schizophyllum commune*. Herbert Voelz and Donald J. Niederpruem..... 1497
Epithelial Cell Penetration as an Essential Step in the Pathogenesis of Bacillary Dysentery. Eugene H. LaBrec, Herman Schneider, Thomas J. Magnani, and Samuel B. Formal..... 1503

NOTES:

In Vitro Assay for Shope Papilloma Virus. John A. Christensen..... 1519
Comparison of Fluorochromes for the Preparation of Fluorescent-Antibody Reagents. Vester J. Lewis and John B. Brooks..... 1520
Method to Facilitate the Isolation of *Clostridium botulinum* Type E. R. Johnston, S. Harmon, and D. Kautter..... 1521
Organic Nutrients Required for Growth and Sporulation of *Bacillus cereus*. H. M. Nakata..... 1522
Selective Medium for Isolation of *Mima* and *Herellea* Organisms. Adrian D. Mandel, Kenneth Wright, and Janet M. McKinnon..... 1524
Relationship of a β-Alanine-Pyruvic Aminotransferase to Reversal of D-Serine Inhibition of Growth. Norman N. Durham, Cloyd D. Jacobs, and Dale Ferguson.. 1525
Use of Safranin O for Characterization of *Brucella* species. Lois M. Jones..... 1527

No. 6, DECEMBER 1964

Responses of *Bacillus subtilis* Spores to Ionic Environment During Sporulation and Germination. H. P. Fleming and Z. John Ordal..... 1529

Effect of Interspecific Transformation on Linkage Relationships of Markers in *Haemophilus influenzae* and *Haemophilus parainfluenzae*. Lois Nickel and Sol H. Goodgal 1538
Spectrochemical Analysis of Inorganic Elements in Bacteria. M. A. Rouf 1545
Inhibition of Ribonucleic Acid Synthesis in Newcastle Disease Virus-Infected Cells by Puromycin and 6-Azauridine. D. E. Wilson and P. LoGerfo 1550
Development of Trehalase and Invertase Activity in *Neurospora*. E. P. Hill and A. S. Sussman 1556
Mechanism of Resistance to Actinomycin in *Bacillus subtilis*. M. Polsinelli, O. Ciferri, G. Cassani, and A. Albertini 1567
Relationship Between Colicinogenic Factors E_1 and V and an F Factor in *Escherichia coli*. Phyllis Kahn and D. R. Helsinki 1573
Physiological State of *Escherichia coli* and the Inhibition of Deoxyribonucleic Acid Synthesis by Phenethyl Alcohol. R. W. Treick and W. A. Konetzka 1580
Effect of Heat Shock on T_4rII Multiplication in *Escherichia coli*. Shanti-Swaroop Kasatiya and Margaret Lieb 1585
Utilization of Aromatic Amino Acids by *Hydrogenomonas facilis*. B. T. DeCicco and W. W. Umbreit 1590
Mutation in Continuous Cultures. III. Mutational Responses in *Escherichia coli*. H. E. Kubitschek and Lynn A. Gustafson 1595
Transfer of Episomic Elements to *Proteus*. II. Nature of *lac*$^+$ *Proteus* Strains Isolated from Clinical Specimens. Stanley Falkow, J. A. Wohlhieter, R. V. Citarella, and L. S. Baron 1598
Evidence for a Tricarboxylic Acid Cycle in *Mycoplasma hominis*. P. J. VanDemark and P. F. Smith 1602
Growth, Plaque Production, and Cationic Stabilization of Rhinovirus Type 1 (Echovirus 28). Abbas M. Behbehani and L. H. Lee 1608
Dependence of the Content of Cell Envelopes on the Growth Rate of *Bacillus megaterium*. I. J. Sud and M. Schaechter 1612
Differentiation of Pathogenic and Saprophytic Leptospires with 8-Azaguanine. Russell C. Johnson and Palmer Rogers 1618
Carbohydrate Nutrition and Sporulation of *Allescheria boydii*. John Cazin, Jr., and David W. Decker 1624
Biosynthesis of Nitro Compounds. I. Nitrogen and Carbon Requirements for the Biosynthesis of β-Nitropropionic Acid by *Penicillium atrovenetum*. Paul D. Shaw and Nancy Wang 1629
Isolation of Toxigenic Strains of *Clostridium novyi* From Soil. S. Nishida and G. Nakagawara 1636
Taxonomy of *Clostridium bifermentans* and *Clostridium sordellii*. I. Their Toxigenicity, Urease Activity, and Sporulating Potency. Shoki Nishida, Kenzo Tamai, and Takayoshi Yamagishi 1641
Taxonomy of *Clostridium bifermentans* and *Clostridium sordellii*. II. Toxigenic and Sporulating Potencies in Substrains of a *Clostridium sordellii* strain. Kenzo Tamai and Shoki Nishida 1647
Genetic Control of Restriction and Modification in *Escherichia coli*. Herbert Boyer 1652
Influence of Substrate-Cofactor Ratios on Partially Purified Inorganic Pyrophosphatase Activity at Elevated Temperatures. Paul F. Mathemeier and Richard Y. Morita 1661
Temperature-Hydrostatic Pressure Studies on Partially Purified Inorganic Pyrophosphatase Activity. Richard Y. Morita and Paul F. Mathemeier 1667
Specificity of Improved Methods for Mycobactin Bioassay by *Arthrobacter terregens*. Alan D. Antoine, Norman E. Morrison, and John H. Hanks 1672
Oxaloacetate Decarboxylation and Oxaloacetate-Carbon Dioxide Exchange in *Acetobacter xylinum*. Moshe Benziman and N. Heller 1678
Biosynthesis of Yeast Carotenoids. Kenneth L. Simpson, T. O. M. Nakayama, and C. O. Chichester 1688
Capsular Polysaccharide of *Azotobacter agilis*. Gary H. Cohen and Donald B. Johnstone 1695

Two Lytic Factors Involved in Induced Synergistic Hemolysis in Normally Non-hemolytic Staphylococci. Doyle C. Smith, V. D. Foltz, and T. H. Lord 1700
Origin and Properties of Naturally Occurring Hapten from *Escherichia coli*. R. L. Anacker, R. A. Finkelstein, W. T. Haskins, M. Landy, K. C. Milner, E. Ribi, and P. W. Stashak 1705
Nutritional Studies of Development in *Schizophyllum commune*. Donald J. Niederpruem, Hudner Hobbs, and Lyle Henry 1721
Differentiation of Exotoxin and Other Biologically Active Substances in *Pseudomonas pseudomallei* Filtrates. Robert J. Heckly 1730
Serology, Density, and Morphology of Staphylococcal Phages. E. D. Rosenblum and Sue Tyrone 1737
Evidence for an Exocellular Site for the Acid Phosphatase of *Saccharomyces mellis*. Ralph Weimberg and William L. Orton 1743
Effect of Catalase and Cultural Conditions on Growth of *Beggiatoa*. Sheril D. Burton and Richard Y. Morita 1755
Isolation and Properties of Intact Mitochondria from Spheroplasts of Yeast. Elizabeth A. Duell, Sakae Inoue, and Merton F. Utter 1762
Ultrastructure of the Exosporium Enveloping Spores of *Bacillus cereus*. Philipp Gerhardt and Edgar Ribi 1774
Morphological Changes in Gram-Negative Bacilli Exposed to Cephalothin. Te-Wen Chang and Louis Weinstein 1790
Use of *S*-Methylcysteine and Cystathionine by Methionineless *Neurospora* Mutants. Joyce L. Wiebers and Harold R. Garner 1798

NOTES:

Constancy of Deoxyribonucleic Acid Base Composition in the Transition of *Sphaerophorus necrophorus* from Bacilli to Large Bodies. V. R. Dowell, Jr., J. C. Loper, and E. O. Hill 1805
Encapsulated Lactobacilli. II. Specific Capsular Reaction of *Lactobacillus casei*. Benjamin F. Hammond, Burton Rosan, and Ned B. Williams 1807
Nocardial Infection in Hatchery-Reared Fingerling Rainbow Trout (*Salmo gairdneri*). S. F. Snieszko, G. L. Bullock, C. E. Dunbar, and L. L. Pettijohn 1809
Evidence for Antibody-Free Staphylococcus-Fibrinogen Reactions. Joan Rotter, Samih Y. Alami, and Florene C. Kelly 1810
Use of Phenethyl Alcohol in Media for Isolation of Anaerobic Bacteria. V. R. Dowell, Jr., E. O. Hill, and W. A. Altemeier 1811
Discrepant Tests for Hydrogen Sulfide. Jerome M. Bulmash and Mac Donald Fulton 1813
Comparative Susceptibility of New Zealand Albino and Dutch Rabbits to Experimental Coccidioidomycosis. Edwin A. Brosbe, Jewell N. Kietzman, and Nathaniel B. Kurnick 1813
Pasteurella sp. From an Epizootic of White Perch (*Roccus americanus*) in Chesapeake Bay Tidewater Areas. S. F. Snieszko, G. L. Bullock, Edgar Hollis, and J. G. Boone 1814
Evaluation of "Floc" as a Replica Plating Material for Bacteria. George Moskovits and Frank P. Moseley 1815
Base Composition of Deoxyribonucleic Acid of Marine and Nonmarine Vibrios Deduced from Buoyant-Density Measurements in Cesium Chloride. R. R. Colwell and M. Mandel 1816
Index of Authors 1819
Index of Subjects 1824
Index of Date of Issue 1834